Interpretive Electronic Music Systems: a Portfolio of Compositions

Julian Rawlinson

Collected scores, supporting software and audio files

Short Circuit	(c. 7'50)
Sample and Hold	(c. 15'00)
Mute | Solo	(6'43)
NCTRN	(c. 9'00)
Radio | Silence	(c. 17'00)
Please use the tramps provided	(c. 30'00)

Submitted in satisfaction of the requirements for the degree of PhD in the University of Edinburgh, 2011

Declaration

I composed this portfolio, the work is my own.

No part of this portfolio has been submitted for any other degree or qualification.

Julian Rawlinson, 10th June 2011

Acknowledgments

I would like to thank my PhD supervisors, Dr. Michael Edwards and Dr. Martin Parker, for the guidance and opportunities they have provided over the last four years, which was bolstered by the encouragement and help offered by other staff and student colleagues working in the Music Department at the University of Edinburgh.

I would especially like to thank Owen Green, Lauren Hayes, David Murray-Rust, and Sean Williams who performed and critiqued these works with dedication, humour, and patience.

Finally, I would like to thank Alyson and my mother, and my family and friends for their unconditional support and belief through this and previous times. Without this, completion of this portfolio would not have been possible.

For Will.

Abstract

A portfolio of electronic music compositions employing adaptable controllers, graphic notation, and custom software performance environments.

The portfolio is comprised of scores, recordings, and supporting software and audio files for the following: *Short Circuit*; *Sample & Hold*; *Mute | Solo*; *NCTRN*; *Radio | Silence*; and *Please use the tramps provided*.

Supplementary files include alternative audio and video recordings of some of the works listed above, additional software documentation, and a video recording of a structured improvisation featuring the controllers and software used in this portfolio.

Contents

Audio CD Contents

CD01

1. *Short Circuit* (7’56) - Studio performance
   Solo performer, laptop, and controllers

2. *Sample and Hold* (14’43) - Studio performance
   Two performers, laptops, and controllers

3. *Mute* | *Solo* (6’43) - Fixed media

4. *NCTRN* (9’12) - Studio recording
   Solo performer, laptop, and controllers

5. *Sample and Hold* (13’11) - Alternative studio performance
   Two performers, laptops, and controllers

CD02

1. *Radio* | *Silence* (17’23) - Concert performance
   Three performers, laptops, controllers, and electronics.

2. *Please use the tramps provided* (30’04) - Concert performance
   Solo performer, laptop, and controllers

3. *Radio* | *Silence* (17’16) - Fixed media

Data DVD Contents

_readme.txt

Audio

- CD01 (folder) - 24 bit audio files as per CD01
- CD02 (folder) - 24 bit audio files as per CD02

Images

- jr_ghostquartet.png - BBC broadcast programme note and image
- jr_max4live.zip - archival screenshots of Max for Live software in editing mode
- jr_maxmsp.zip - archival screenshots of MaxMSP software in editing mode

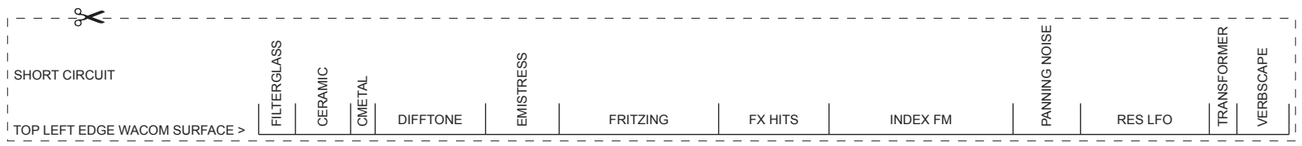
Software

- jr_nctrn_files.zip - files required for performing *NCTRN*
- jr_radiosilence_files.zip - files required for performing *Radio* | *Silence*
- jr_samplehold_files.zip - files required for performing *Sample and Hold*
- jr_shortcircuit_files.zip - files required for performing *Short Circuit*
- jr_tramps_files.zip - files required for performing *Please use the tramps provided*

Video

- LLEAPP.mp4 - structured concert improvisation by three performers featuring the controllers and software used in this portfolio.
- MuteSolo.mp4 - research based, alternative realisation of Mute | Solo, with four performers, laptops and electronics.

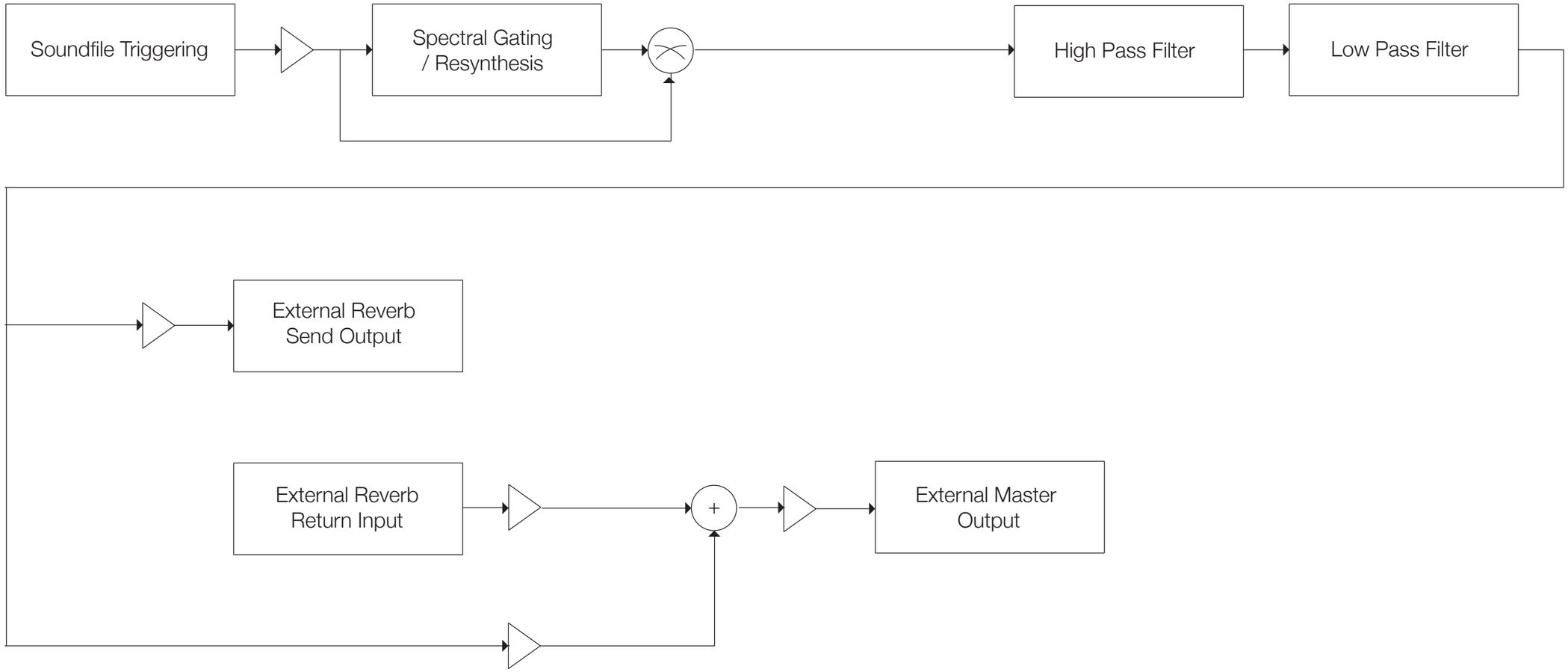
REFERENCE GUIDES SCALED TO SUIT WACOM INTUOS3 A6 WIDE, ENSURE PRINTER IS SET TO PRINT 100%

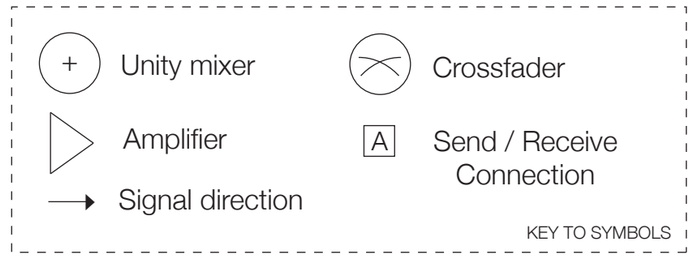


Short Circuit

Solo performer, laptop, and controllers (c. 7'50)

Submitted in part satisfaction of the requirements for the degree of PhD in the University of Edinburgh, 2011





Short Circuit - Process and signal schematic

Performance note

Short Circuit is a broadly programmatic work for a solo performer that imagines the sonic life of an electrical circuit. Gestures and passages represent resistance, capacitance, voltage sources, and current flow, through changes in sound class, event density, energy, and spectral bandwidth.

A studio recording that demonstrates the general character of the work is available on the attached CD, or to download at http://www.pixelmechanics.com/shortcircuit.

The work is in part a technical exercise that maps a large number of sound files into a relatively small performance surface (a graphics tablet), while still offering some precision in triggering these files in realtime. Triggered sound files can be post processed with serial high and low pass filters and subsequent dry/wet balance of amplitude and frequency sensitive gating/resynthesis.

A graphic score provides a timeline for working with classes of soundfiles, and outlines a coarse gestural character. The score does not indicate specific soundfiles to be triggered, but instead suggests a class of file, and overall duration of the work, and individual passages, will vary as a function of duration of triggered sounds.

The performer creates fine detail through interpretive and exploratory responses to the supplied sound library and processors. At phrase level, more or fewer soundfiles may need to be triggered than are indicated in the score, due to the variable durations and character of individual soundfiles within each class.

Throughout the score, annotations provides some instruction as to type, depth, and/or range of modulation/processing, and also dynamic levels. In some cases dynamic range should be treated as a variable parameter falling between two limits, e.g. pp < > ff means "some value between" pp and ff. Reverberation is left to performer discretion, but should add a moderate ambience to audio output

As preparation for performance, players should become familiar with the general character of the sound classes. A scaled reference that maps the sound classes to the graphics tablet surface is included in this document, and this can be printed and attached to the graphics tablet for performance. Performers may choose to mark some favoured soundfiles at their discretion.

Technical requirement & signal processes

1 x 2 channel PA system
1 x Small format mixing board (Mackie 1202 or similar, minimum 4 input channels, 2 aux sends/returns, and 2 outputs)
1 x High quality stereo reverb unit (Lexicon, TC Electronics or similar)
1 x Apple MacBook Pro Intel 2GHz or better running Cycling '74 MaxMSP 5
1 x High quality multichannel audio interface (RME Fireface, Metric Halo or similar, minimum 4 output channels)
1 x Wacom Intuos3 A6 (wide) graphics tablet
1 x MIDI controller providing 16 faders / potentiometers

NB. all processes and subpatchers (shown in parentheses) referred to below are contained in the main _jr.shrtcrct.maxpat MaxMSP file. More information on the processes can be found in the Instrument and Device guides section of this document.

1 x Soundfile triggering (jr.5.wacombuf) Polyphonic soundfile triggering with optional control of playback direction and attenuated random pitch/speed offset
1 x Spectral gating / resynthesis (jr.5.thresher) Amplitude and frequency sensitive spectral gating
1 x High pass filter (jr.5.simplesvf) 12dB/octave high pass filter
1 x Low pass filter (jr.5.simplesvf) 12dB/octave low pass filter

Computer setup

The MaxMSP patches, externals and soundfiles required to perform the work can be downloaded from http://www.pixelmechanics.com/shortcircuit, or copied from the attached DVD. The directory structure should be left intact after extraction and the root directory should be added to the MaxMSP search path with Subfolders option checked. (NB. to avoid external and abstraction conflicts only one root folder from Jules Rawlinson's works should be added to the MaxMSP search path at a time.) The _jr.shrtcrct.maxpat MaxMSP file hosts all the instruments and processors used to perform the work as bpatchers (modular devices with GUI). Two sets of stereo outputs are provided in the patch, one for the master output, and another which can be configured as a pre-fader send to the external reverb unit (set to a Plate type reverb). This configuration provides an easy way to generate a wet/dry balance in performance. The reverb return can also be optionally routed back into the MaxMSP environment.

Performance patch overview

The performance patch _jr.shrtcrct.maxpat has been been designed to automatically load a controller mapping preset and all soundfiles into the appropriate instruments. Soundbank folders can also be dropped into instruments if necessary.

MIDI and key mappings can be re-configured and saved as required for the performers individual setup using drop-down boxes and assignment abstraction on individual bpatchers and sub-patcher "sends.controls". Instructions for mapping and saving MIDI and keystroke information can be found in the subpatcher "sends.controls" in _jr.shrtcrct.maxpat.

Instrument and device guides

jr.5.wacombuf

This instrument is played with the Wacom graphics tablet and triggers short soundfiles. Soundfiles are mapped onto the X axis, and soundfile amplitude is mapped onto the Y axis. Reverse playback can be triggered by holding down the tip switch.

Overall amplitude control sits between the instrument and post-processing, and a control input is provided for attenuating randomised re-pitching of the sample. Output from this instrument is sent through the *jr.5.thresher* FFT processor and serial high and low pass filters, before reaching the main outputs.

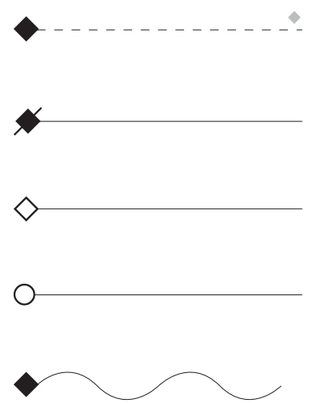
jr.5.thresher

This device is a wrapper for the (FFTease) Thresher~ external. Thresher~ provides amplitude and frequency sensitive spectral gating, and can provide output that ranges from spectral filtering and resonance, chaotic burbling and glissandi swarms through to sustained oscillation/resynthesis.

The device has control inputs for dry/wet balance, threshold and damping. Threshold controls should be set to 50%, but may need to be varied up to 100% according to material. Damping control values above 50% create glissandi of varying speed and density. A damping value of exactly 50% will generate a static (’frozen’) oscillation. There is an additional key input (F) for triggering this value as it can be difficult to position sliders or potentiometers accurately. Damping control values below 50% will create a short, watery resonance.

Score symbols

The score illustrates the sonic nature of the triggered material in respect of spectromorphology using a notation based on the Sonova font developed by Lasse Thoreson and Andreas Hedman (2007, 2009, 2010). Some extra symbols devised by the composer (marked * in the following key) have been included to differentiate material (i.e. one symbol and tail combination per sound class) and aid score reading during performance. The text below refers to sound file class names as found on the Wacom template and the score.



Notes

Thoreson, L. and Hedman, A. (2007) *Spectromorphological analysis of sound objects: an adaptation of Pierre Schaeffer's typomorphology*, in Organised Sound 12(2): 129-141

Thoreson, L. and Hedman, A. (2009) *Sound-objects, Values and Characters in Åke Parmerud's Les objets obscurs, 3rd Section*, in Organised Sound 14(3): 310-320

Thoreson, L. and Hedman, A. (2010) *Form-Building Patterns and Metaphorical Meaning*, in Organised Sound 15(2): 82-95

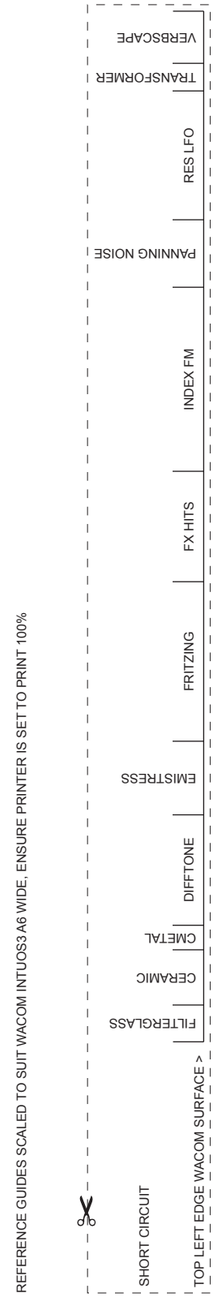
The composer would like to thanks Lasse Thoreson and Andreas Hedman for their help with the Sonova Font. http://www.spectromusic.com/

The following MaxMSP externals and abstractions are included in this software distribution for convenience, with source and author(s) noted below:

mp.assignment - http://www.tinpark.com/category/research/software/
(Martin Parker)

wacom - http://cnmat.berkeley.edu/downloads
(Jean-Michel Couturier, Richard Dudas, and Michael Zbyszynski)

thresher~ - http://www.sarc.qub.ac.uk/~elyon/LyonSoftware/MaxMSP/FFTease/
(Eric Lyon, Christopher Penrose)



10

00 : 00 : 05 : 10 : 15

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

HIGH PASS FILTER

REDUCE HIGH PASS FILTER CUT-OFF FREQUENCY

FRITZING FADES OUT

11

00 : 15 : 20 : 25 : 30

FILTERGLASS

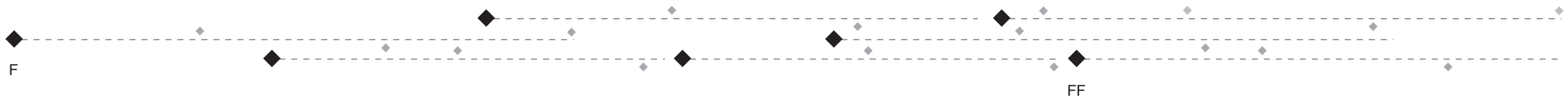
CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING



FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL LIGHT FILTER MODULATION

00 : 30 : 35 : 40 : 45

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

MP

FX HITS

INDEX FM

F MF

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

LIGHT FILTER MODULATION

00 : 45 : 50 : 55 01 : 00

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

MP

FX HITS

MF

INDEX FM

F

MF

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

LIGHT FILTER MODULATION

01 : 00 : 05 : 10 : 15

FILTERGLASS

CERAMIC

MF

CMETAL

DIFFTONE

EMISTRESS

FRITZING

MP

FX HITS

F

INDEX FM

F

MF

F

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

LIGHT FILTER MODULATION

01 : 15 : 20 : 25 : 30

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

F F F

EMISTRESS

FRITZING

FX HITS

INDEX FM

FF FF

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

HARD & FAST LOW PASS FILTER GESTURE

INCREASE LOW PASS FILTER FREQUENCY UNTIL FULLY OPEN

HARD & FAST LOW PASS FILTER GESTURE

MODERATE LOW PASS FILTER GESTURE

INCREASE LOW PASS FILTER FREQUENCY UNTIL FULLY OPEN

INCREASE LOW PASS FILTER FREQUENCY UNTIL FULLY OPEN

ALL SOUNDS FADE OUT

01 : 30 : 35 : 40 : 45

FILTERGLASS

CERAMIC

CMETAL

M F

DIFFTONE

EMISTRESS

FRITZING

FX HITS

F F

INDEX FM

PANNING NOISE

# # # #

PP > FF F M F

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

TRANSITION TO PANNING NOISE

MODERATE FILTER MODULATION

01 : 45 : 50 : 55 02 : 00

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

PP < > FF

FX HITS

INDEX FM

PANNING NOISE

M P

PP > FF

RES LFO

M F

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

MODERATE FILTER MODULATION

ALL SOUNDS FADE OUT

02 : 00 : 05 : 10 : 15

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

PP > FF

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

MODERATE FILTER MODULATION

02 : 15 : 20 : 25 : 30

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

PP <> FF

PP <> FF

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

FLURRIES

FORWARDS & REVERSE TRIGGERING

MODERATE FILTER MODULATION

NOISE FADES OUT

02 : 30 : 35 : 40 : 45

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

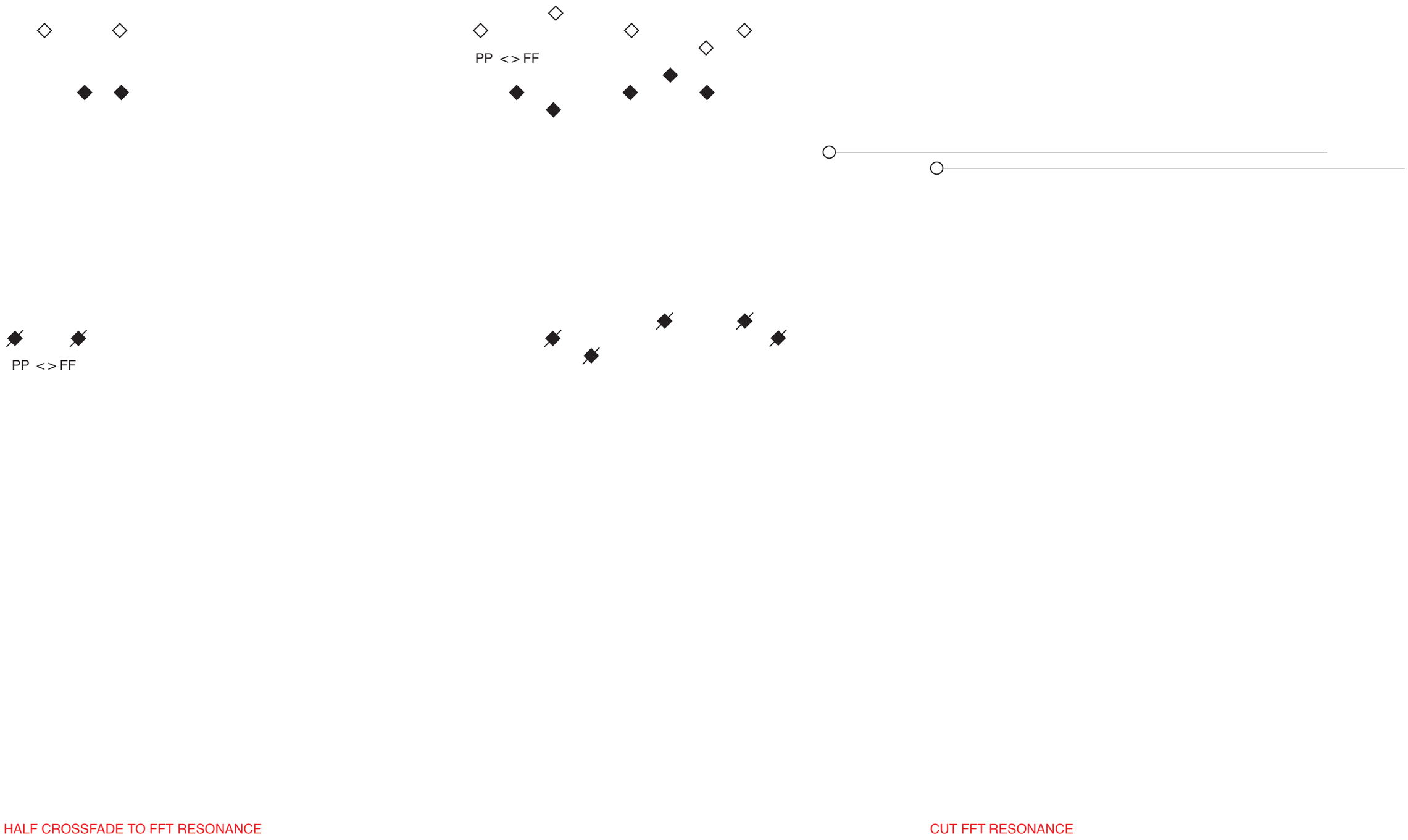
TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL



21

02 : 45 : 50 : 55 03 : 00

FILTERGLASS

P

CERAMIC

PP <> FF

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

PP <> FF

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

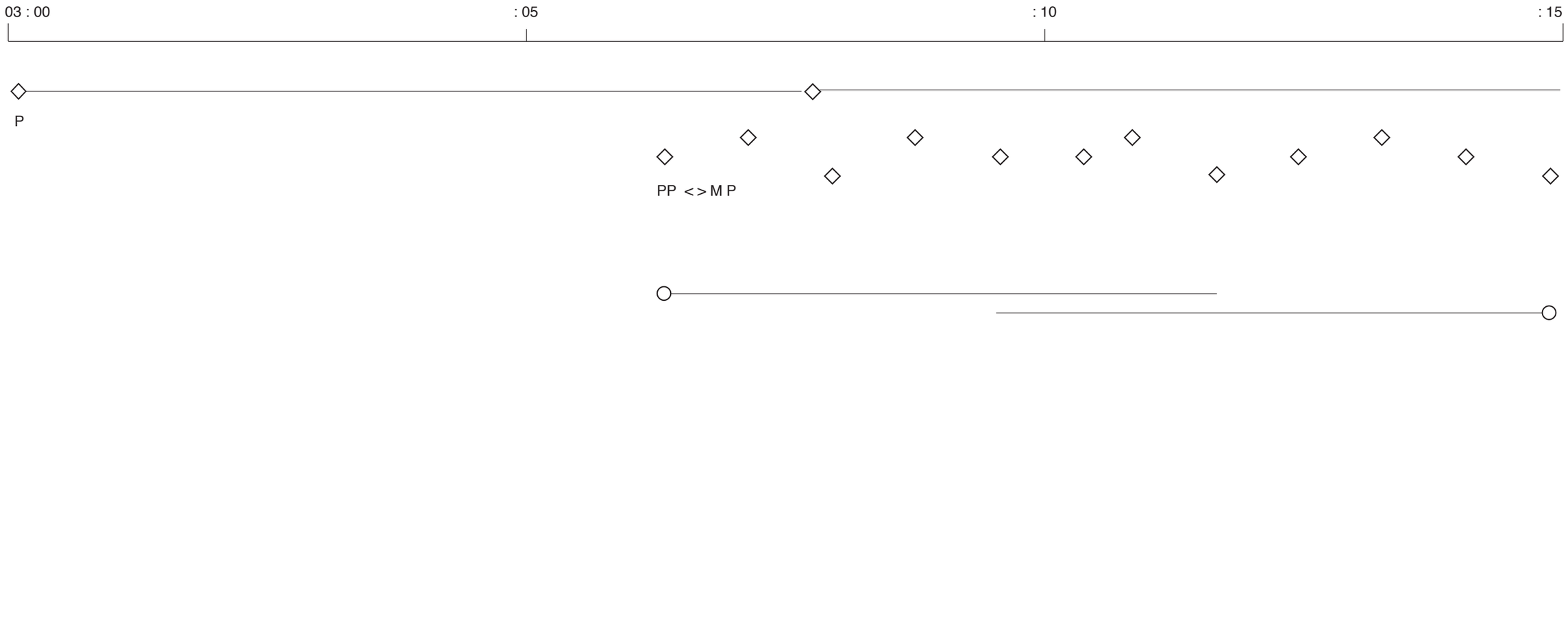
FFT OSCILLATION

GENERAL

HALF CROSSFADE TO FFT RESONANCE

ALL SOUNDS FADE OUT

CUT FFT RESONANCE



SPARSE

FORWARDS & REVERSE TRIGGERING

MODERATE FILTER MODULATION

03 : 15 : 20 : 25 : 30

FILTERGLASS

CERAMIC

PP <> M P

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

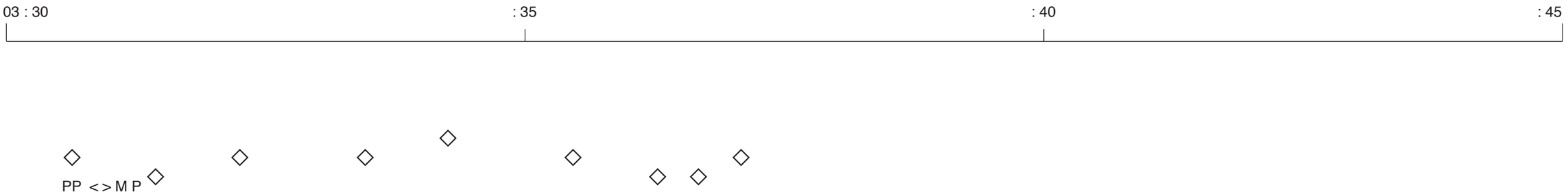
FFT GLISSANDI

FFT OSCILLATION

GENERAL

HALF CROSSFADE TO FFT OSCILLATION

24



FILTERGLASS

CMETAL

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

SPARSE

MODERATE FILTER MODULATION

CUT FFT OSCILLATION

03 : 45 : 50 : 55 04 : 00

FILTERGLASS

CERAMIC

PP <> M P

CMETAL

PP <> M P

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

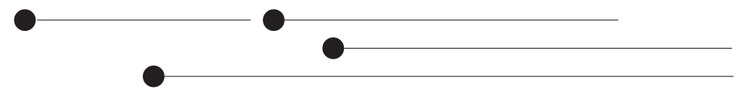
RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION



GENERAL

HALF CROSSFADE TO FFT RESONANCE

HALF CROSSFADE TO FFT OSCILLATION

04 : 00 : 05 : 10 : 15

FILTERGLASS

CERAMIC

PP <> FF

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

PP <> FF

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

MODERATE FILTER MODULATION

FULL CROSSFADE TO FFT OSCILLATION

HALF CROSSFADE TO FFT OSCILLATION

04 : 15 : 20 : 25 : 30

FILTERGLASS

CERAMIC

PP <> FF

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

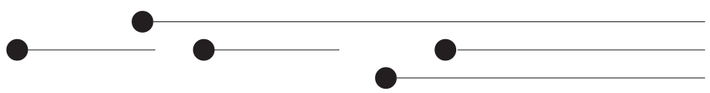
TRANSFORMER

VERBSCAPE

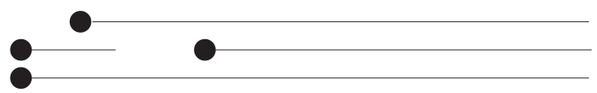
FFT GLISSANDI

FFT OSCILLATION

GENERAL



SHARP CUT FFT OSCILLATION



HALF CROSSFADE FFT OSCILLATION

FULL CROSSFADE TO FFT GLISS

04 : 30 : 35 : 40 : 45

FILTERGLASS

CERAMIC

PP <> FF

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

HALF CROSSFADE FFT OSCILLATION

FULL CROSSFADE TO FFT GLISS

CUT FFT GLISS

HALF CROSSFADE TO FFT GLISS

04 : 45 : 50 : 55 05 : 00

FILTERGLASS

CERAMIC

PP <> FF

CMETAL

PP <> FF

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

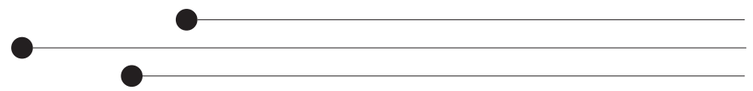
RES LFO

TRANSFORMER

VERBSCAPE

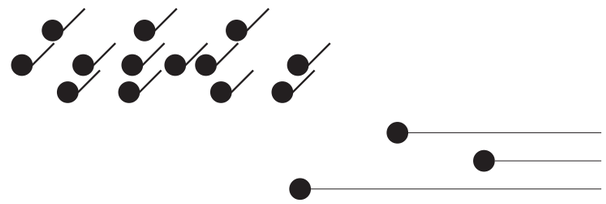
FFT GLISSANDI

FFT OSCILLATION



FULL CROSSFADE TO SHARP FFT OSCILLATION FROM FFT GLISS

HOLD UNTIL 4:54 THEN CUT & RETRIGGER



FULL CROSSFADE TO FFT GLISS THEN SHARP OSCILLATION

GENERAL

05 : 00 : 05 : 10 : 15

FILTERGLASS

CERAMIC

CMETAL

PP <> FF

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

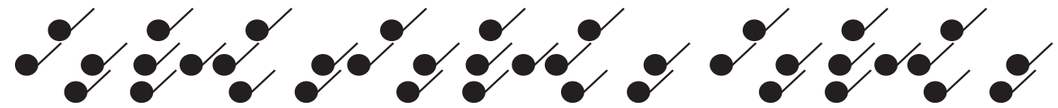
TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL



FULL CROSSFADE TO FFT GLISS

LOW LEVEL FFT GLISS

05 : 15 : 20 : 25 : 30

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

PP < > M P

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

MODERATE FILTER MODULATION

05 : 30 : 35 : 40 : 45

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

PP <> M P

EMISTRESS

FRITZING

FX HITS

M F

INDEX FM

PANNING NOISE

RES LFO

M F > F

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

HEAVY FILTER MODULATION

LOW LEVEL FFT GLISS

LIGHT FILTER MODULATION

05 : 45 : 50 : 55 06 : 00

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

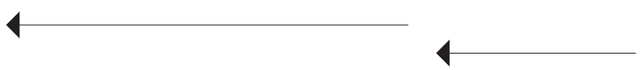
PANNING NOISE

RES LFO

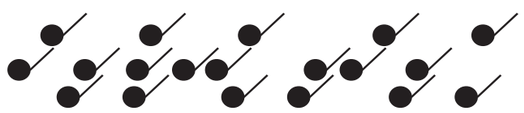
M F > F

TRANSFORMER

VERBSCAPE



FFT GLISSANDI



FFT OSCILLATION

GENERAL

LOW LEVEL FFT GLISS

HALF CROSSFADE TO FFT GLISS

HOLD UNTIL 5:53 THEN CUT FF

LIGHT FILTER MODULATION

06 : 00 : 05 : 10 : 15

FILTERGLASS

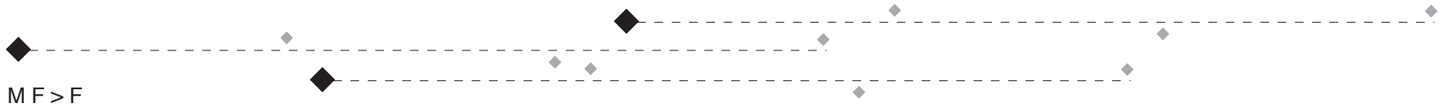
CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING



FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

LIGHT FILTER MODULATION

06 : 15 : 20 : 25 : 30

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

PP > M P

EMISTRESS

FRITZING

FX HITS

PP > M P

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

INCREASE HP FILTER CUTOFF

TRANSFORMER FADES OUT

INCREASE HP FILTER CUTOFF

06 : 30 : 35 : 40 : 45

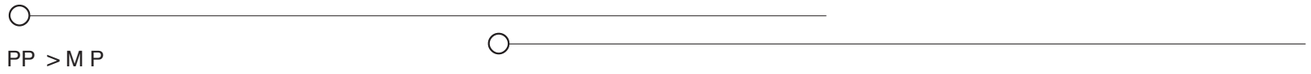
FILTERGLASS

CERAMIC

CMETAL

PP < > M P

DIFFTONE



PP > M P

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

M F > FF

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

REDUCE HP FILTER CUTOFF

MODERATE FILTER MODULATION

06 : 45 : 50 : 55 07 : 00

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

M F > FF

FF

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

LIGHT FILTER MODULATION

07 : 00 : 05 : 10 : 15

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

PP > M P

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

TRANSITION TO ELECTRIC MISTRESS

HALF CROSSFADE TO FFT RESONANCE

07 : 15 : 20 : 25 : 30

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

PP > M P

FX HITS

INDEX FM

PANNING NOISE #

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

CUT FFT RESONANCE

40

07 : 30 : 35 : 40 : 45

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

PP > M P

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

GENERAL

MODERATE FILTER MODULATION

HALF CROSSFADE TO FFT OSCILLATION

SINGLE DIFFTONE

LIGHT FILTER MODULATION

FADE OUT FFT OSCILLATION

41

07 : 45 : 50 : 55 08 : 00

FILTERGLASS

CERAMIC

CMETAL

DIFFTONE

EMISTRESS

FRITZING

FX HITS

INDEX FM

PANNING NOISE

RES LFO

TRANSFORMER

VERBSCAPE

FFT GLISSANDI

FFT OSCILLATION

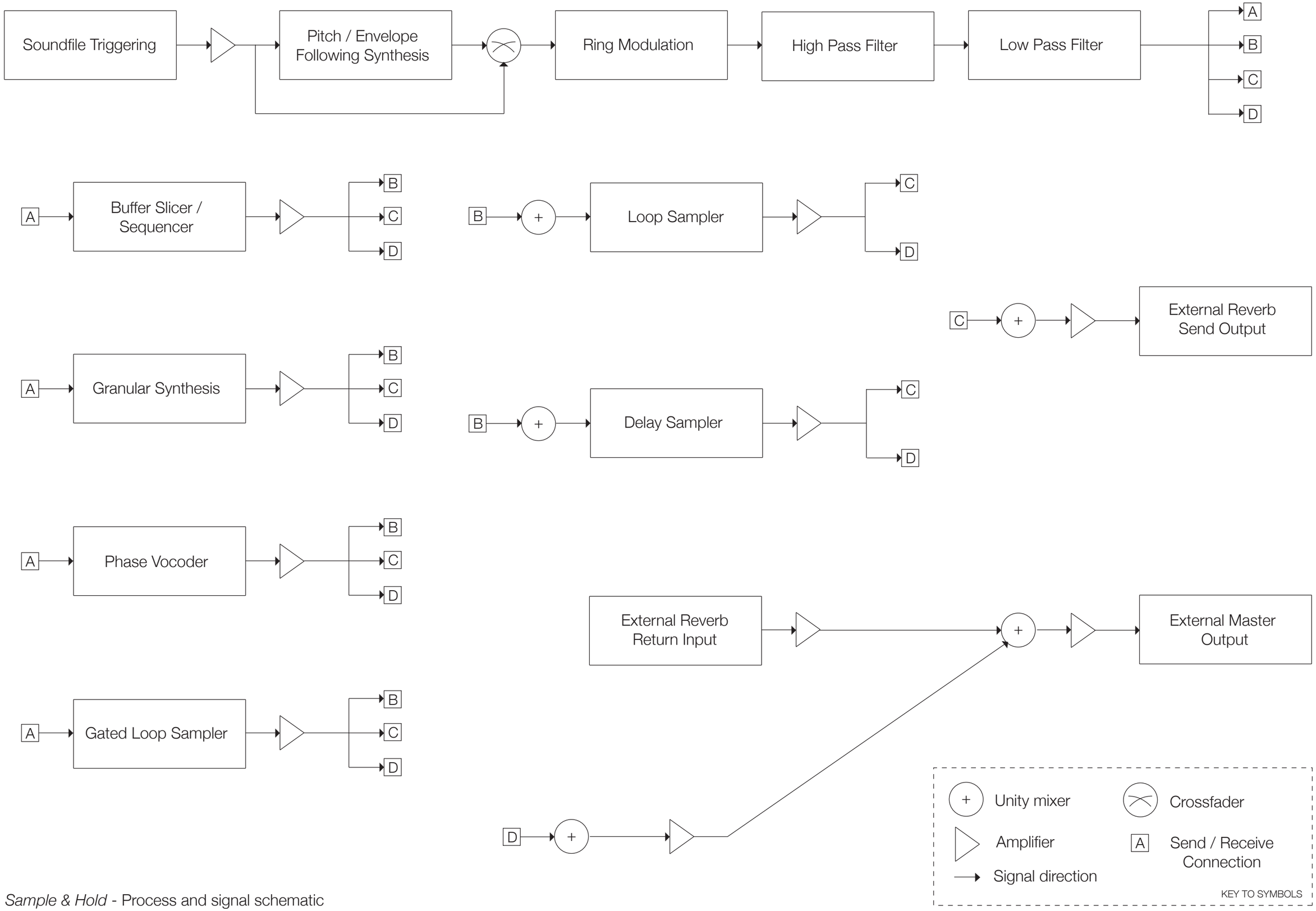
GENERAL

DIFFTONE FADES OUT TO END

Sample and Hold

Two performers, laptops, and controllers (c. 15'00)

Submitted in part satisfaction of the requirements for the degree of PhD in the University of Edinburgh, 2011



Sample & Hold - Process and signal schematic

Performance note

Sample and Hold is a work for two performers that pitches the (sampled) acoustic against the electronic within a loose structural framework that supports a variety of outcomes.

Two studio recordings are available to listen to on the attached CD, or to download at http://www.pixelmechanics.com/samplehold. These demonstrate the general character and variable aspect of the work.

In synthesis, a sample and hold circuit is used to create momentary values from a dynamic control voltage, and, taken to an extreme, represents the digitisation of an analogue source. The work investigates the above through a variety of realtime sampling processes.

A sound library consisting of sustained articulations on bass clarinet and viola, cello and violin pizzicati, and assorted junk percussion, is contrasted with, and complemented by, soundfiles generated through analogue modular synthesis. These electronic sounds are by turns throbbing, fizzing, crackling, whistling, and chirping.

A graphics tablet is used to trigger these acoustic and electronic soundfiles through filtering and modulation processes, before being sent to an array of sampling devices that are in turn controlled by the graphics tablet and MIDI devices.

The results can be stuttered, frozen, and buffered, and then reshaped to create twinkling flurries of sonic spindrift, glitching counterpoint, and icy digital fragments that contrast with the natural warmth of the original acoustic and analogue electronic sources.

Coarse structure is described by graphic notation and written instruction, and performers are responsible for creating fine detail through interpretive, intuitive and exploratory responses to the supplied instruments and sound library.

Player 1 should adopt the lead role, and is geneally responsible for the flow of the work. A suggested timeline is indicated, but may be varied by perfomers through expansion or compression of sections to suit performances in the region of 13 to 17 minutes, following the works structure for material and technique.

Technical requirement and signal processes

1 x 2 channel PA system
1 x Small format mixing board (Mackie 1202 or similar, minimum 8 input channels, 2 aux sends/returns, and 2 outputs)
1 x High quality stereo reverb unit (Lexicon, TC Electronics or similar)

Each performer requires:

1 x Apple MacBook Pro Intel 2GHz or better running Cycling '74 MaxMSP 5
1 x High quality multichannel audio interface (RME Fireface, Metric Halo or similar, minimum 4 output channels)
1 x Wacom Intuos3 A6 (wide) graphics tablet
1 x MIDI key controller offering 8 potentiometers (M-Audio Oxygen 8 or similar)
1 x MIDI controller providing 16 faders / potentiometers (Faderfox LV1 preferred)

NB. all processes and subpatchers (shown in parentheses) referred to below are contained in the main _jr.samplehold.maxpat MaxMSP file. More information on the processes can be found in the Instrument and Device guides section of this document.

1 x Soundfile triggering (jr.5.wacombuf) Polyphonic soundfile triggering with optional control of playback direction and attenuated random pitch/speed offset
1 x High pass filter (jr.5.simplesvf) 12dB/octave high pass filter
1 x Low pass filter (jr.5.simplesvf) 12dB/octave low pass filter
1 x Buffer slicer / sequencer (jr.5.slicer) Monophonic sampling loop slicer/sequencer
1 x Granular synthesis (jr.5.grn.patcher) Live or sampled buffer granulation with gated output and variable index, grain envelope and grain length
1 x Phase Vocoder (jr.5.pvoc) Monophonic sampling phase vocoder with gated output and variable buffer index
1 x Gated loop sampler (jr.5.gesture) Monophonic samping looper with gated output and variable playback speed and direction
2 x Loop sampler (jr.5.ezlooper) Looper with variable playback speed and direction
1 x Delay sampler (jr.5.autosample) Polyphonic variable probability sampling delay

Computer setup

The MaxMSP patches, externals and soundfiles required to perform the work can be copied from the attached DVD, or downloaded from http://www.pixelmechanics.com/samplehold. The directory structure should be left intact after extraction and the root directory should be added to the MaxMSP search path with Subfolders option checked. (NB. to avoid external and abstraction conflicts only one root folder from Jules Rawlinson's works should be added to the MaxMSP search path at a time.) The _jr.samplehold.maxpat MaxMSP file hosts all the instruments and processors used to perform the work as bpatchers (modular device with GUI).

2 sets of stereo outputs are provided in the patch, one for the main output, and another which can be configured as a pre-fader send to the external reverb unit (set to a Plate type reverb). This configuration provides an easy way to generate a wet/dry balance in performance.

Performance patch overview

The performance patch _jr.samplehold.maxpat has been been designed to autoload a controller mapping preset and all soundfiles into the appropriate instruments. Soundbank folders can also be dropped into instruments if necessary.

MIDI and key mappings can be re-configured and saved as required for the performers individual setup using drop-down boxes and assignment abstraction on individual bpatchers and sub-patcher "sends.controls".

Where MIDI preset mapping is not available, MIDI note and controller numbers are indicated as these can often be configured on the MIDI device. Instructions for mapping and saving MIDI and keystroke information can be found in the subpatcher "sends.controls" in _jr.samplehold.maxpat.

A number of sample triggering and sampling instruments and effects are provided that can be mixed and processed as appropriate to the character of the performance. The devices are equipped with inputs for mapping parameters to controller devices and some devices offer additional on-screen controls.

The Wacom graphics tablet bpatcher devices are equipped with a toggle to turn on/off controller data coming from the device in the device GUI. As multiple devices can be active, interesting layers of sound can be achieved with the performer's focus and intention shifting between instruments.

Score overview

The score provides information for the two performers over two lanes, a 'sounding' lane, and an 'action' lane. The sounding lane illustrates the likely sonic outcome of the material in respect of spectromorphology and coarse frequency. The action lane contains instructions for triggering soundfiles and sampling to devices, and outlines a target gestural character.

Throughout the score, the action lane provides some instruction as to type, depth, and/or range of modulation/processing, and also dynamic levels. In some cases dynamic range should be treated as a variable parameter falling between two limits, e.g. pp < > ff means "some value between" pp and ff. Reverberation is left to performer discretion, but should add a moderate ambience to audio output.

Words like 'choppy', 'turntablism', and 'telegraphing' are used to describe gestural types (e.g. slicing and slashing, rapid forwards/backwards playback, and morse-code like patterns)

The sounding lane employs a notation based on the Sonova font developed by Lasse Thoreson and Andreas Hedman (2007, 2009, 2010), and includes some symbols devised by the composer (marked * in the following key) that enhance a performance reading of the score.

○ sine-like object / event (e.g. filtered clarinet harmonics)

◇ quasi-pitched object / event

◆ inharmonic object / event

□ broadband percussive object / event

■ complex percussive object / event

● pitched object / event

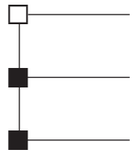
◗ pitched impulse with decay (e.g. pizzicato) *

◇—— solid horizontal line indicates sustained tone

◇- - - dashed horizontal line indicates sustained impulses

◇/ angled solid line indicates variable sustained tone (generally short pitch
⊘ or spectral movement within an object or event in this score)

granular accumulation



layered complex / soundweb

sustained graphics tablet movement/modulation *

load soundbank indicated by key *
(where two soundbanks are indicated, rapidly alternate between them)

trigger sampling to device indicated by key *
(defaults: S = slicer, P = pvoc, G = granulator, W = gesture, E = ezlooper)

Instrument guide and special cases

jr.5.wacombuf

This instrument is played with the Wacom graphics tablet and triggers short soundfiles, which can be post-processed via a crossfading pitch follower, ring modulation and high and low pass filtering. Soundfiles are mapped onto the X axis, and soundfile amplitude is mapped onto the Y axis. Reverse playback can be triggered by holding down the tip switch.

Overall amplitude control sits between the instrument and post-processing, and a control input is provided for attenuating randomised re-pitching of the sample. Output from this instrument is sent to the main output, looping and sampling instruments, and autosampling effects.

For this work soundfiles are stored in 9 soundbanks (with internal sound types), which can be loaded into the instrument via mapped keystrokes as indicated in the score (keys 1 to 8, corresponding to soundbanks below). The score does not generally indicate specific soundfiles to be triggered, but instead suggests a type of file. As preparation for performance, both players should become familiar with the general character, layout and position of soundbanks and types on the graphics tablet as described here.

01_Acoustic - bass clarinet harmonics, bass clarinet subtones

02_Acoustic - viola harmonics (artificial), viola harmonics (natural)

03_Acoustic - cello pizzicato, viola pizzicato, violin pizzicato

04_Acoustic - trumpet, clarinet, hoof shakers, grain clusters, skip gongs, large gongs

05_Electronic - thin drones, throbber, transformer, tube feedback

06_Electronic - splutter, splutter resonance, swell, swellverb

07_Electronic - atonal, klang, FM, pulse train

08_Electronic - brushverb, chirp, puncture, storm

There are some key files that are notable exceptions to this general use as listed below, and their position on the Wacom tablet is noted below.

01_Acoustic

CLRNT SUBTONE A#0 - this file is located on the extreme right of the tablet.

CLRNT HARMONIC Ab4 - this file is located on the extreme left of the tablet.

02_Acoustic

VLA HARM NTRL Gb6 - this file is located on the extreme right of the tablet, and is also marked (1) on the score for convenience.

NB Within the viola section, the score includes markings for a number of other tones that should be regularly triggered. These are (2), (3), HIGH, MID, and LOW. The performer is free to chose files they wish to trigger at these markings, but they should be sympathetic to the bass clarinet tones described above, and to the earlier viola tone. The composer suggests that performers could mark their position on the tablet with electrical tape and marker pen.

04_Acoustic

TRUMPET - this file is located on the extreme left of the tablet.

GONGS - these files are located on the extreme right of the tablet.

jr.5.slicer

This instrument is played with the Wacom graphics tablet, or with onscreen multisliders, and provides slicing and sequencing of sampled input, generating glitch effects and stuttering loops.

Control inputs are provided for sequence rate, sequence activity, recording trigger, and overall output level. Output from this instrument is sent to the main output, looping instruments, and autosampling effects.

jr.5.pvocpatcher

This instrument is played with the Wacom graphics tablet and provides FFT resynthesis of sampled input. Buffer position is mapped to the X axis and amplitude is mapped to the Y axis. Control inputs are provided for recording trigger and overall output level.

If the graphics tablet is toggled-off while the stylus is still touching the tablet a sustain can be effected. Output from this instrument is sent to the main output, looping instruments, and autosampling effects.

jr.5.grn.patcher

This instrument is played with the Wacom graphics tablet and MIDI key controller and provides granulation of sampled input, and can generate synchronous and asynchronous grains. Grain start point (in the buffer) is mapped to the X axis and grain amplitude is mapped to the Y axis.

A control input is provided for recording trigger (plus controller 25), loop recording (live granulation, controller 24), and MIDI and on-screen controls for grain speed (controller 91), grain speed jitter (93) , grain position jitter (71), grain duration (74), grain duration jitter (84), grain pitch jitter (1), grain amplitude (7), and high (5) and low (10) pass filter cutoff.

Grain window types are Hanning (controller 20, val 127), Exponential Attack (21), and Exponential Decay (22).

Output from this instrument is sent to the main output, looping instruments, and autosampling effects.

jr.5.gesture

This instrument is played with the Wacom graphics tablet and provides gated looping of sampled input with variable speed and direction. Speed and direction are mapped to the X axis (-2 to 2 times original playback rate at the tablet extremes) and amplitude is mapped to the Y axis.

Control inputs are provided for recording trigger and overall output level. A sustained loop can be achieved by toggling-off this device on the MaxMSP interface while the stylus is still touching the tablet. This instrument sends output to the main output and looping instruments.

jr.5.ezlooper

This instrument is played with a midi controller and provides a sustained loop of sampled input variable speed and direction. Control inputs are provided for speed / direction (-1 to 1 times original playback rate at the tablet extremes), recording trigger and overall output level.

The composer's preference is for speed and direction to be mapped to a high quality midi-enabled crossfader such as those found on Faderfox controllers, affording rapid and precise changes in speed and direction that produce effects similar to turntablism.

Output from this instrument is sent to the main output.

jr.5.autosample

This effect provides polyphonic variable pitch and direction delays. A control input is provided for a random activity threshold. When the control is at its maximum level the effect is not active. As the threshold level is increased the device is more likely to sample incoming audio into an an available voice for delayed playback.

Output from this instrument is sent to the main output.

Notes

Thoreson, L. and Hedman, A. (2007) *Spectromorphological analysis of sound objects: an adaptation of Pierre Schaeffer's typomorphology*, in Organised Sound 12(2): 129-141

Thoreson, L. and Hedman, A. (2009) *Sound-objects, Values and Characters in Åke Parmerud's Les objets obscurs, 3rd Section*, in Organised Sound 14(3): 310-320

Thoreson, L. and Hedman, A. (2010) *Form-Building Patterns and Metaphorical Meaning*, in Organised Sound 15(2): 82-95

The composer would like to thanks Lasse Thoreson and Andreas Hedman for their help with the Sonova Font. http://www.spectromusic.com/

This work makes use of edited Violin, Viola, Cello, and Bass Clarinet samples sourced from http://www.philharmonia.co.uk/thesoundexchange/make_music/samples/library/

The following MaxMSP externals and abstractions are included in this software distribution for convenience, with source and author(s) noted below:

fiddle~ - http://crca.ucsd.edu/~tapel/software.html
(Miller Puckette, MSP port by Ted Apel and David Zicarelli)

mp.assignment - http://www.tinpark.com/category/research/software/
(Martin Parker)

mp.grainwindow~ - http://sd.caad.ed.ac.uk/maxhelp/2010/11/mp-grainwindow/
(Martin Parker)

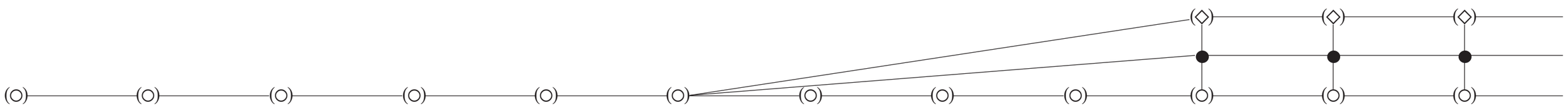
wacom - http://cnmat.berkeley.edu/downloads
(Jean-Michel Couturier, Richard Dudas, and Michael Zbyszynski)

Performer Notes

0:00 0:20 0:40 1:00

PLAYER 1 SOUNDING LANE

1



PLAYER 1 ACTIONS LANE

CLRNT SUBTONE
A#0

REGULAR TRIGGERS CREATING A CONTINUOUS TONE

INCREASING LP FILTER CUTOFF

SAMPLE TO EZLOOPER

MF

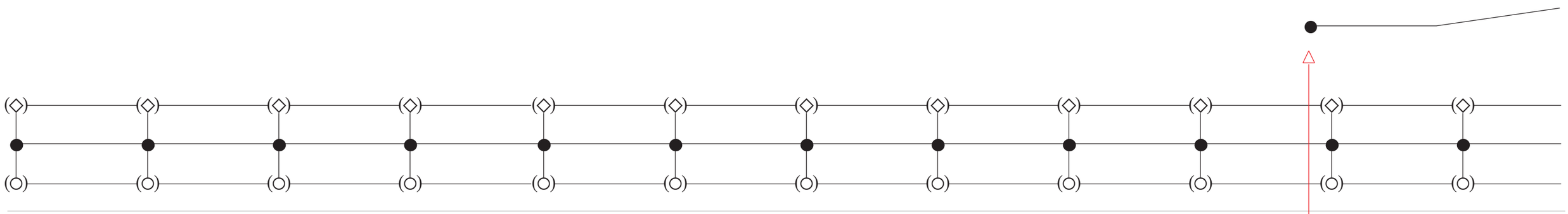
E

MODERATE HP & LP FILTERING

PLAYER 2 SOUNDING LANE

PLAYER 2 ACTIONS LANE

1:00 1:10 1:20 1:30



FADE UP EZLOOPER

CLRNT HARMONIC
Ab4

MF

PLAYERS ENTER TOGETHER

2

VLA HARM (1) (1) (2)
NTRL Gb6

F

PLAYER 2 ENTERS WHEN THEY ARE AWARE
OF THE BREATH TONE IN PLAYER 1 PART

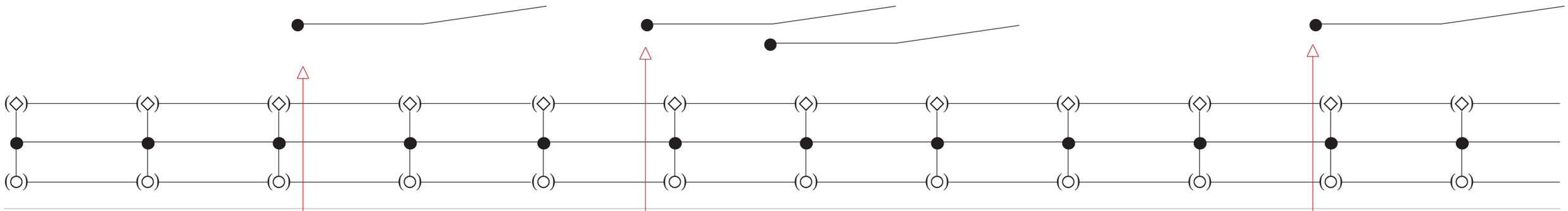
VLA HARM (1) (1) (2)
NTRL Gb6

F

VLA HARM (1) (1) (2)
NTRL Gb6 (3)

F

1:30 1:40 1:50 2:00



CLRNT HARMONIC
Ab4
MF

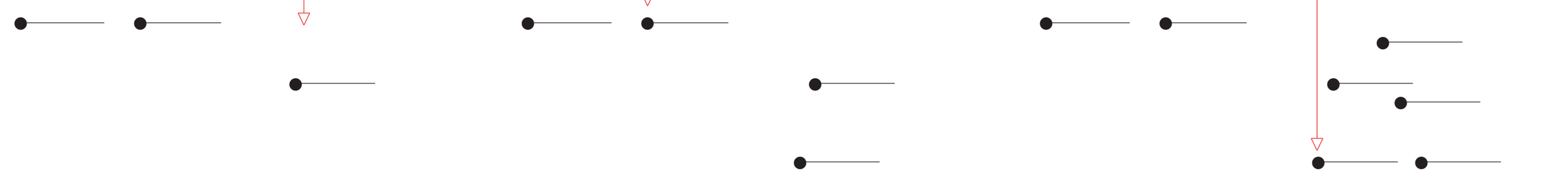
PLAYERS ENTER TOGETHER

CLRNT HARMONIC
Ab4
MF

PLAYERS ENTER TOGETHER

CLRNT HARMONIC
Ab4
MF

PLAYERS ENTER TOGETHER



VLA HARM (1) (1) (2)
NTRL Gb6

F

VLA HARM (1) (1) (2)
NTRL Gb6 (3)

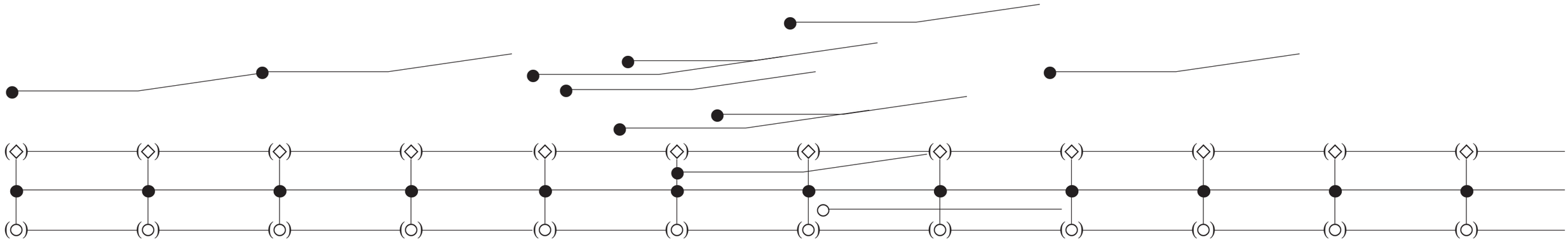
F

VLA HARM (1) (1) (2)
NTRL Gb6 (3)

F

HIGH
MID
LOW
@ 500MS INTERVALS

2:00 2:10 2:20 2:30



MF

CLRNT HARMONIC
Ab4
MF

MIXED CLRNT HARMONIC ACCUMULATION

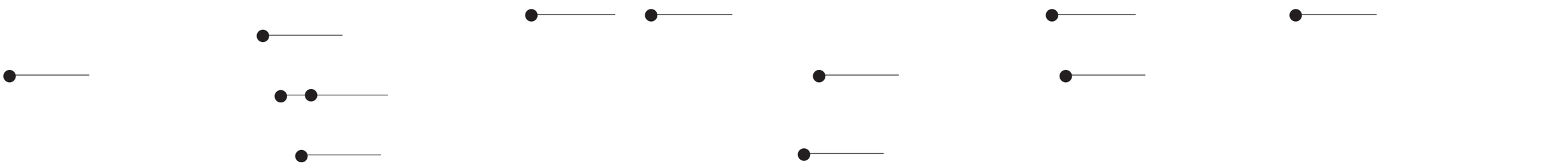
MF

CLRNT SUBTONE

MF

CLRNT HARMONIC
Ab4
MF

FADE OUT EZLOOPER



(2)

HIGH
MID
LOW
MID

@ 500MS INTERVALS

VLA HARM (1)
NTRL Gb6

F

(1)

(2)
(3)

VLA HARM (1)
NTRL Gb6 (2)

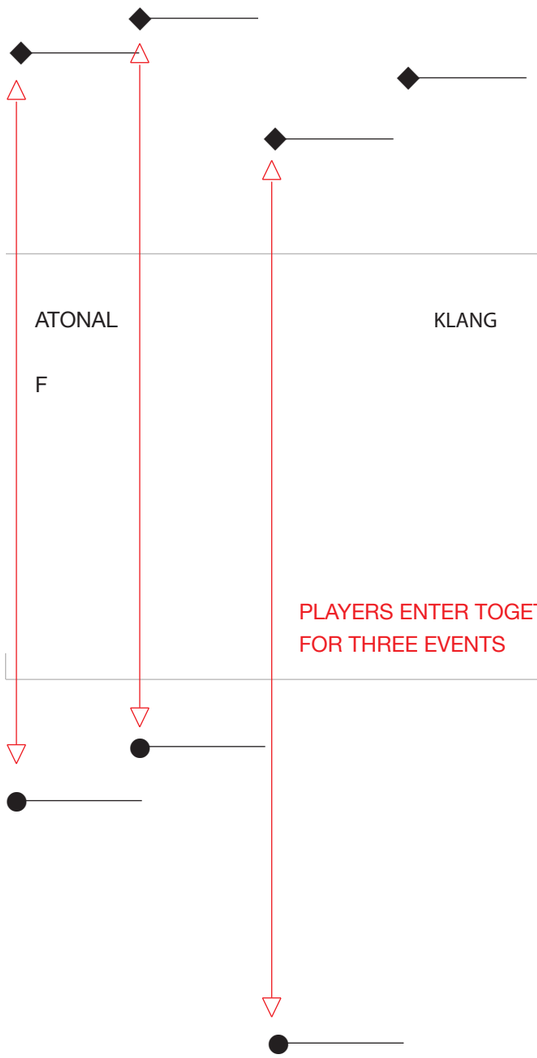
F

VLA HARM (1)
NTRL Gb6

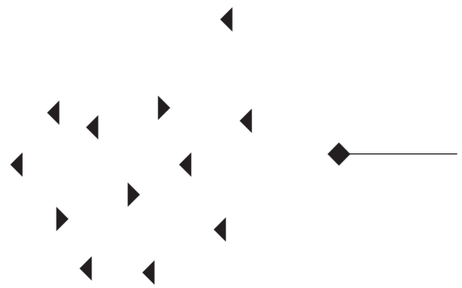
F

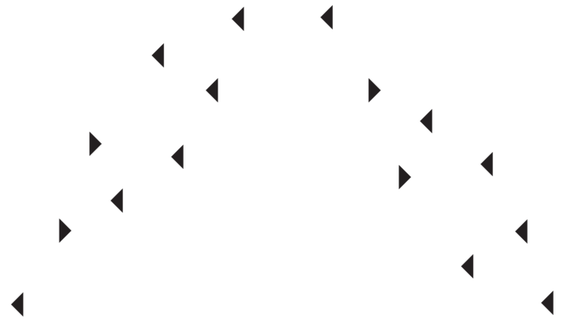
2:30 2:40 2:50 3:00

7



3





ATONAL

F

KLANG

PLAYERS ENTER TOGETHER
FOR THREE EVENTS

PIZZ FLURRY MOSTLY RVRS

F

PITCH FOLLOWER 50%
AUTOSAMPLE THRESHOLD 0 < > 50% > 0%

ATONAL

F

PITCH FOLLOWER 0%

PIZZ FLURRY MOSTLY RVRS, UPWARD THEN DOWNWARD GLISS

F

PITCH FOLLOWER 50%
AUTOSAMPLE THRESHOLD 50%

VLA HARM FREE PITCH

F

WACOMBUF PITCH DEVIATION 33%

ANY HIGH

MP

ANY LOW

MP

ANY MID

F

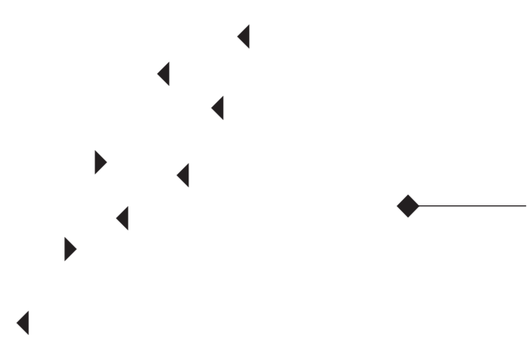
(1)

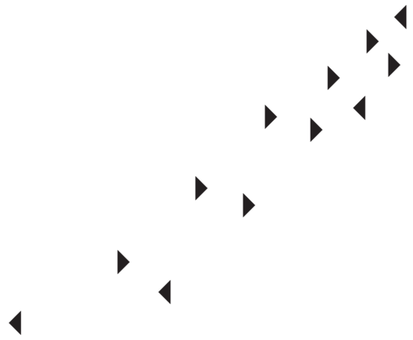
(1)

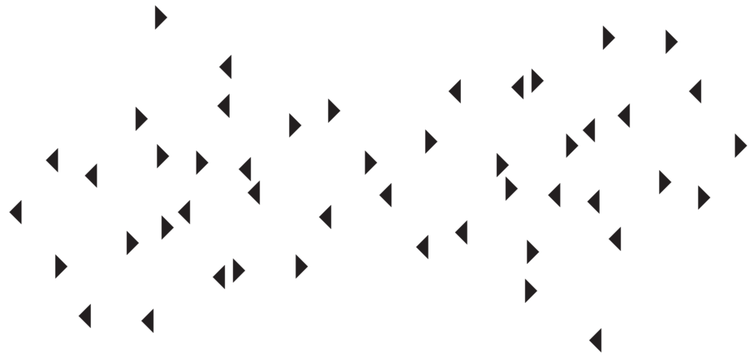
PITCH DEVIATION 0%

(1)

3:00 3:10 3:20 3:30







PIZZ FLURRY MOSTLY RVRS, UPWARD GLISS

F

ATONAL

PIZZ ACCEL MOSTLY FWD, HOCKETING UPWARD GLISS

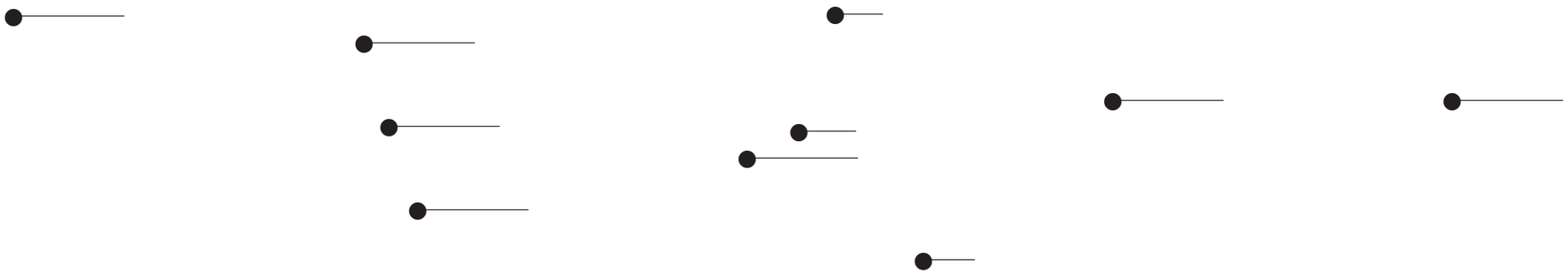
F

PITCH FOLLOWER 0%
AUTOSAMPLE THRESHOLD 0%

PIZZ RAINDROPS FREE DIRECTION & PITCH

F

PITCH FOLLOWER 0 < > 50%
AUTOSAMPLE THRESHOLD 0 < > 50%



(1)

HIGH
MID
LOW
@ 500MS INTERVALS

MIXED VLA HARM FREE PITCH

PP < > F

WACOMBUF PITCH DEVIATION 33%

(2)

PITCH DEVIATION 0%

(2)

3:30 3:40 3:50 4:00

PIZZ ACCEL MOSTLY FWD, HOCKETING UPWARD GLISS

F

PITCH FOLLOWER 0%
AUTOSAMPLE THRESHOLD 0%

PITCH FOLLOWER 0%
AUTOSAMPLE THRESHOLD 50%

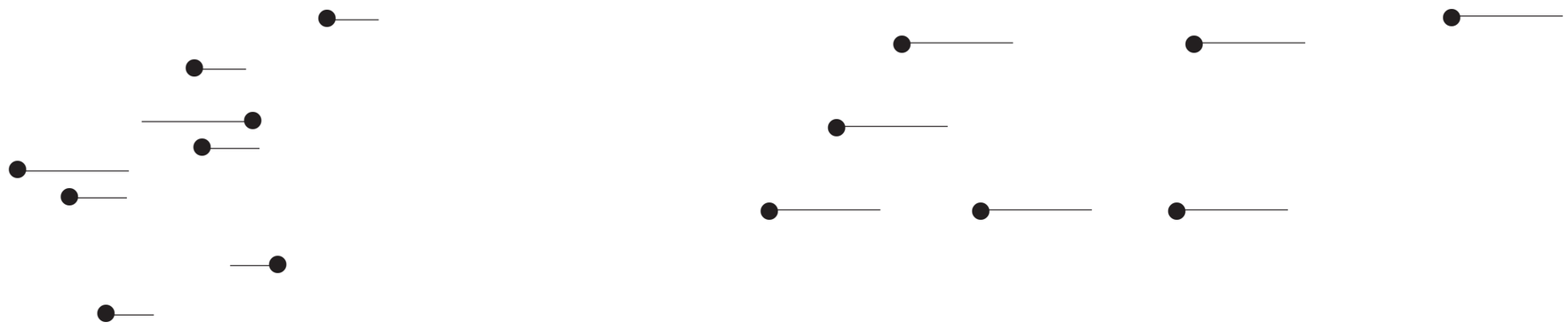
PIZZ FLURRY MOSTLY RVRS, UPWARD GLISS

BECOMING MORE REGULAR

F

PITCH FOLLOWER 0 < > 50%
AUTOSAMPLE THRESHOLD 0 < > 50%

PITCH FOLLOWER 0%
AUTOSAMPLE THRESHOLD 0%



MIXED VLA HARM FREE PITCH

PP < > F

WACOMBUF PITCH DEVIATION 33%
AUTOSAMPLE THRESHOLD 0 < > 50%

PITCH DEVIATION 0%
AUTOSAMPLE THRESHOLD 0%

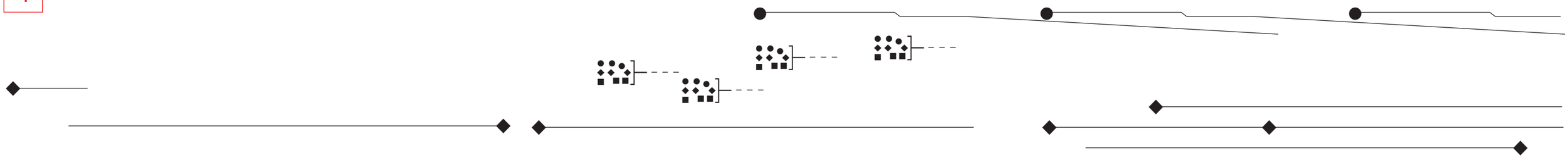
LOW
MID
HIGH
LOW

HIGH
LOW

(1)

4:00 4:10 4:20 4:30

4



SKIP GONG

REVERSE GONG PAUSE

F

M

LARGE GONG

GOAT HOOF SHAKERS FLURRY PAPER GRAINS FLURRY

F

MF F

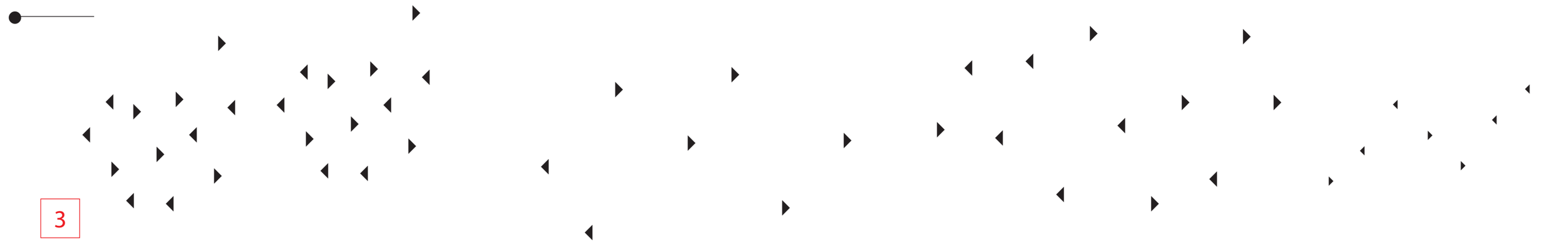
TRUMPET & GONGS

MP > FF

STEADY REPEATED TRIGGERS

TRUMPET

MF



3

(1) PIZZ FLURRY FREE DIRECTION & PITCH PAUSE SPARSE PIZZ FREE DIRECTION & PITCH BECOMING MORE REGULAR

F F

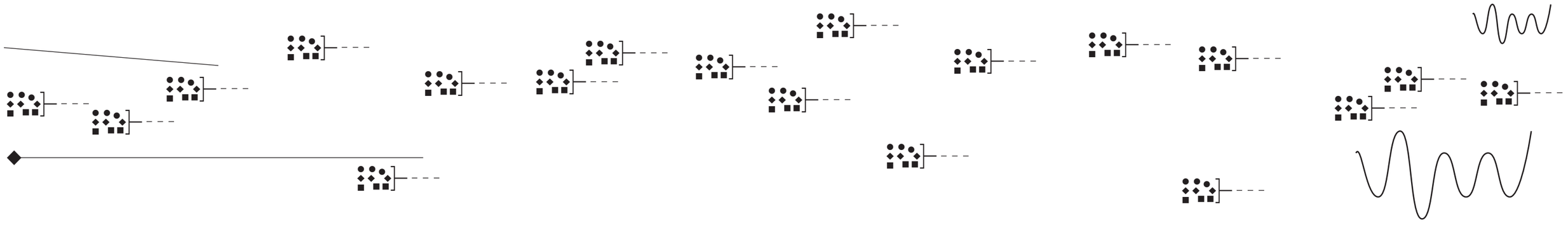
PITCH FOLLOWER 0 < > 50%
AUTOSAMPLE THRESHOLD 0 < > 50%

PITCH FOLLOWER 0 < > 50%
AUTOSAMPLE THRESHOLD 0 < > 50%

PITCH FOLLOWER 0%

S SAMPLE TO SLICER SET SLICER SEQUENCE & FADE UP SLICER

4:30 4:40 4:50 5:00



MIXED GRAINS & PERCUSSION

F

LARGE GONG

FF

MIXED CLARINETS & MIXED GRAINS

MP < > F

MIXED GRAINS

PP < > FF

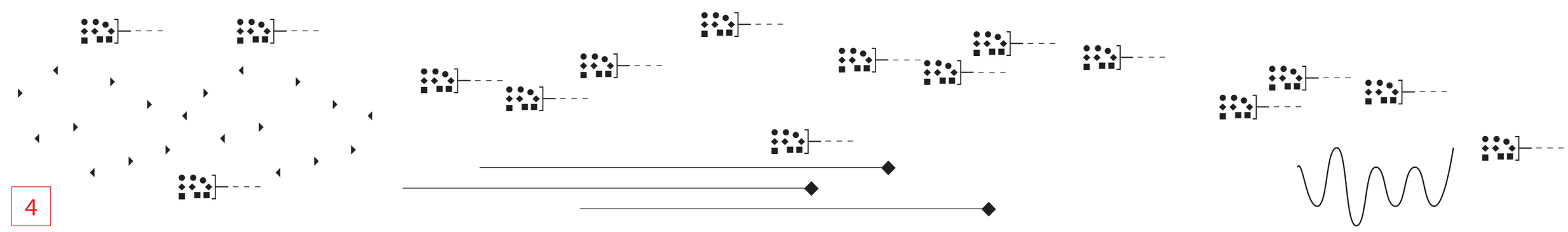
SAMPLE TO EZLOOPER & WACOM GESTURE

E W

FADE OUT WACOM BUFFER

FADE UP EZLOOPER

FADE UP WACOM GESTURE



4

GOAT HOOF SHAKERS

P

AUTOSAMPLE THRESHOLD 0%

MODIFY SLICER SEQUENCE

REVERSE GONGS & GOAT HOOF SHAKERS

MP < > F

FADE OUT SLICER SEQUENCE

GOAT HOOF SHAKERS

PP < > FF

SAMPLE TO EZLOOPER & WACOM GESTURE

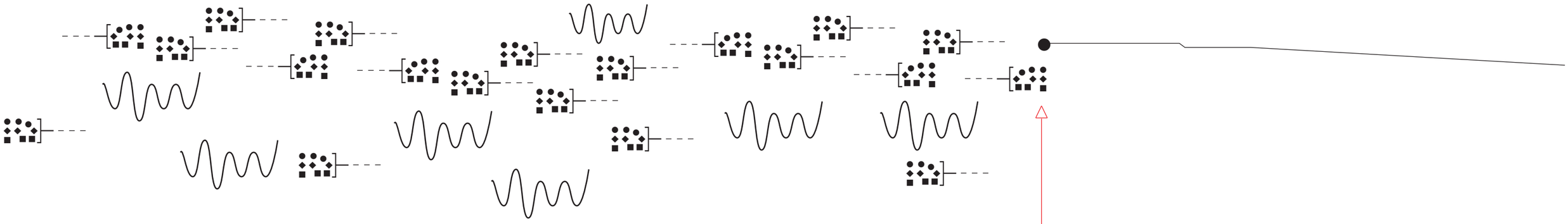
E W

FADE OUT WACOM BUFFER

FADE UP EZLOOPER

FADE UP WACOM GESTURE

5:00 5:30 6:00 6:10



WACOM GESTURE & EZLOOPER

VERY GRANULAR

RAPID CHANGES OF SPEED & DIRECTION

TURNTABLISM & TELEGRAPHING

FADE OUT EZLOOPER

WACOM GESTURE SOLO

AUTOFX 50%

AUTOFX 0%

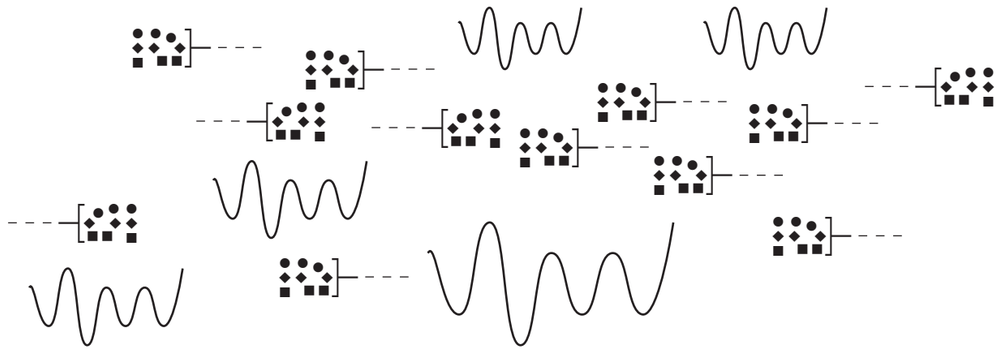
TRUMPET

MF

CUT WACOM GESTURE

FADE UP WACOM BUFFER

PLAYERS ENTER TOGETHER



WACOM GESTURE & EZLOOPER

RAPID CHANGES OF SPEED & DIRECTION

TURNTABLISM & TELEGRAPHING

FADE OUT EZLOOPER

CUT WACOM GESTURE

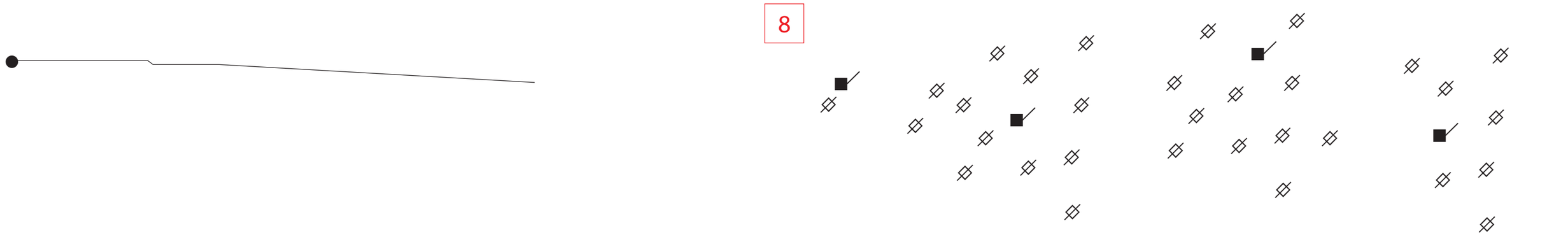
LARGE GONG

F

REVERSE GONG

MP

6:10 6:20 6:30 6:45



TRUMPET

MF

BRUSHVERB & CHIRP STABS

F BRUSHVERB FLURRIES

P < > FF PITCH DEVIATION 30%

STRONG HP & LP FILTERING

SAMPLE TO WACOM GESTURE & PVOC W P E SAMPLE TO EZLOOPER

LARGE GONG

F

REVERSE GONG

F

6:45 7:00 7:15 7:30

BRUSHVERB & CHIRP STABS

F

FADE OUT WACOM BUFFER

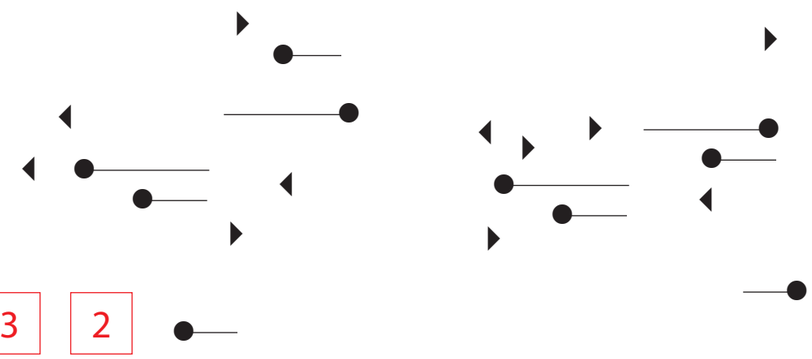
FADE UP PVOC

FADE UP WACOM GESTURE

PVOC & WACOM GESTURES

TURNTABLISM & TELEGRAPHING

SHORT IRREGULAR BURSTS



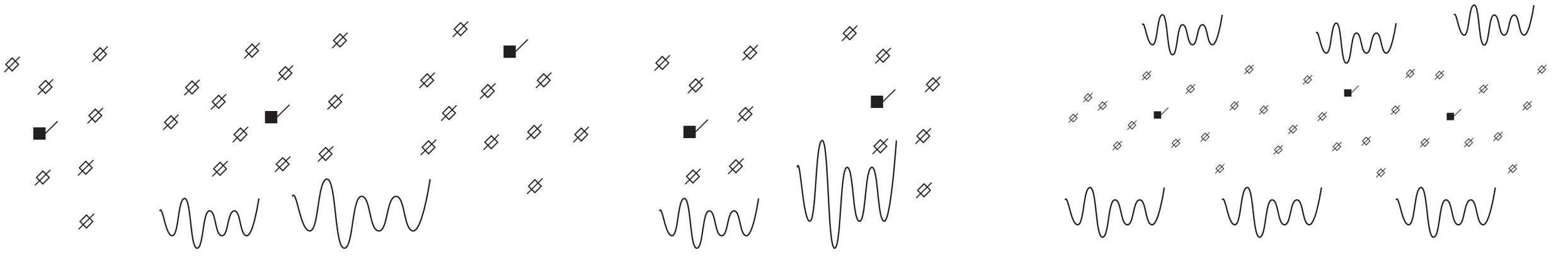
3 2

MIXED VLA & PIZZ FREE DIRECTION & PITCH SHORT IRREGULAR BURSTS

P < > F

WACOMBUF PITCH DEVIATION 33%

7:30 7:45 8:00 8:15



PVOC & WACOM GESTURES

TURNTABLISM & TELEGRAPHING

SLOWING GESTURES

CUT PVOC

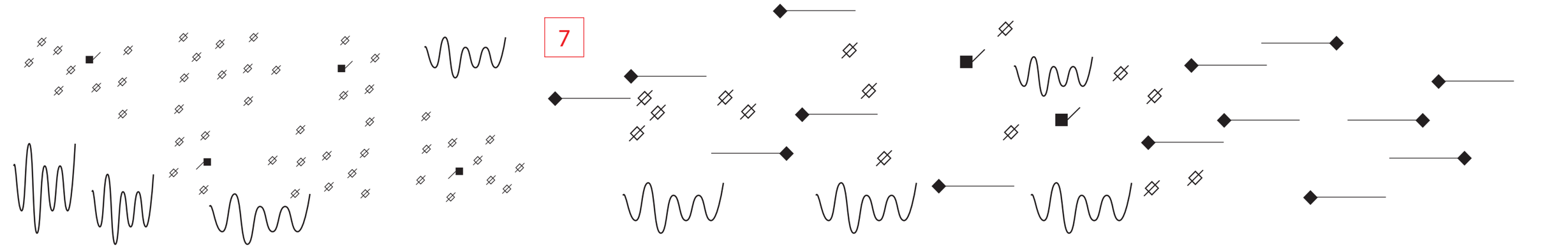
CHOPPY

PVOC SOLO

SHORT & FIDGETY

CUT WACOM GESTURES

8:15 8:30 8:45 9:00



PVOC GESTURES

VERY SHORT & FIDGETY

MIX ATONAL, FM & KLANG

P < > F

FADE UP WACOM BUFFER

FADE UP WACOM GESTURES

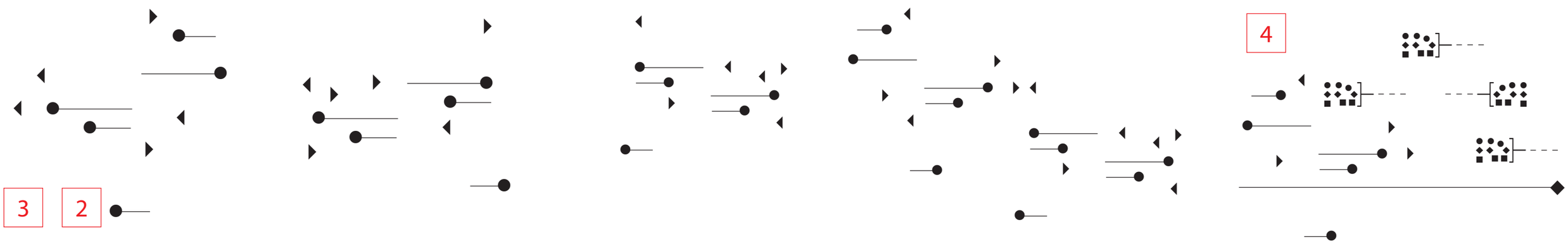
E SAMPLE TO EZLOOPER

WACOM BUFFER PITCH DEVIATION 33%

FADE UP EZLOOPER

CUT PVOC & WACOM GESTURES

RAPID CHANGES OF SPEED & DIRECTION



MIXED VLA & PIZZ FREE PITCH & DIRECTION, SHORT IRREGULAR BURSTS

P < > F

WACOMBUF PITCH DEVIATION 33%

SAMPLE TO EZLOOPER E

FADE UP EZLOOPER

RAPID CHANGES OF SPEED & DIRECTION

LARGE GONGS FREE DIRECTION

GOAT HOOF SHAKERS & GRAINS FLURRY

F

MF

G SAMPLE TO GRANULATOR

9:00 9:10 9:20 9:30

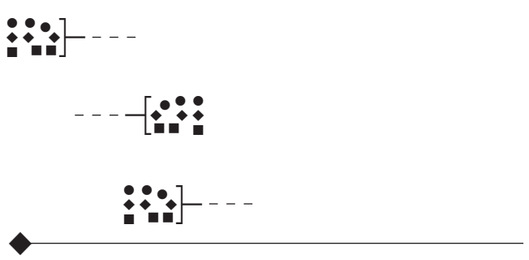
4

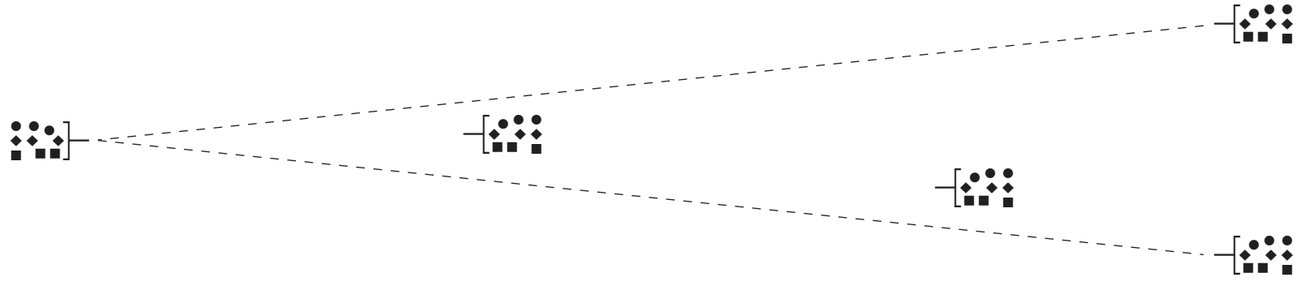
TRUMPET

F

TRUMPET

MP





GRANULATOR

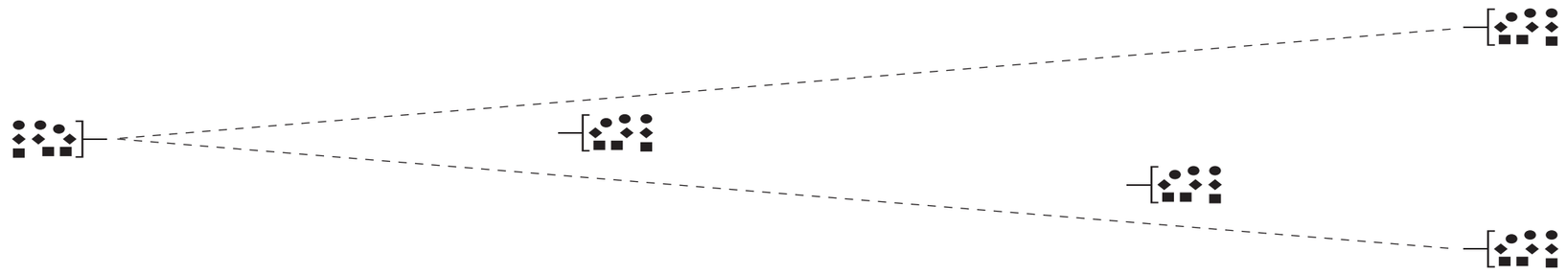
PPP > F

SPARSE, SHORT GRAINS

MODERATE HP & LP FILTERING

INCREASING DENSITY & LENGTH

9:30 9:45 10:00 10:15



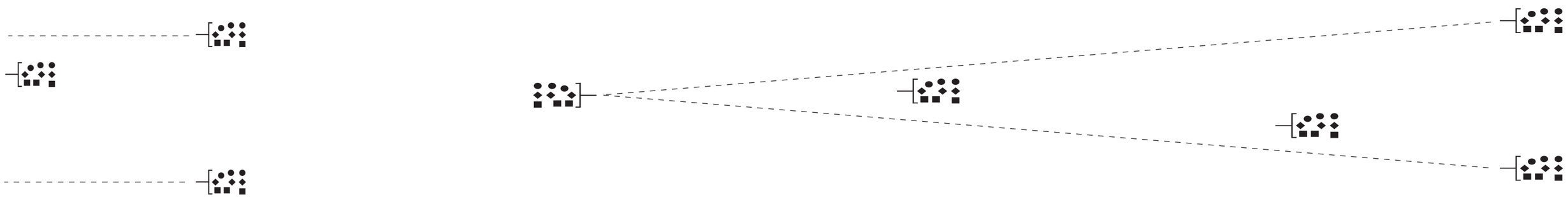
GRANULATOR

PPP > F

SPARSE, SHORT GRAINS

INCREASING DENSITY & LENGTH

MODERATE HP & LP FILTERING



CUT

GRANULATOR

PPP > F

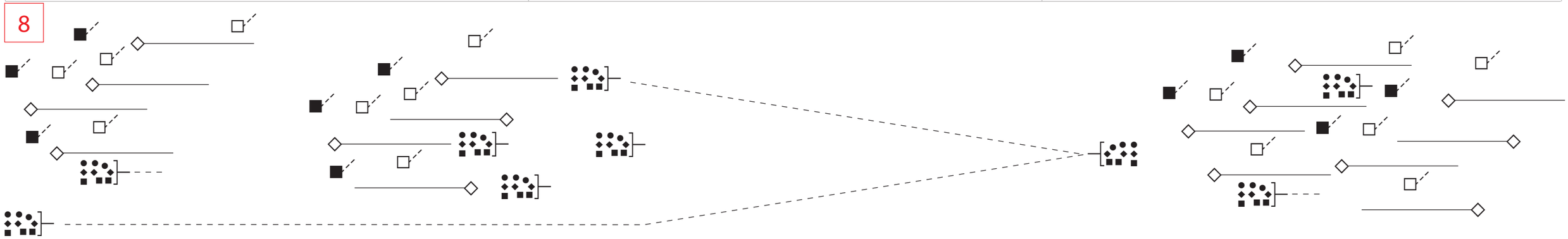
SPARSE, SHORT GRAINS

INCREASING DENSITY & LENGTH

MODERATE HP & LP FILTERING

10:15 10:30 10:45 11:00

8



MIX CHIRPS, PUNCTURE, STORM, GRAINS FLURRIES

P < > F

AUTOSAMPLE THRESHOLD 50%

SAMPLE TO GRANULATOR & GESTURE G W

EXTREME BANDPASS FILTERING

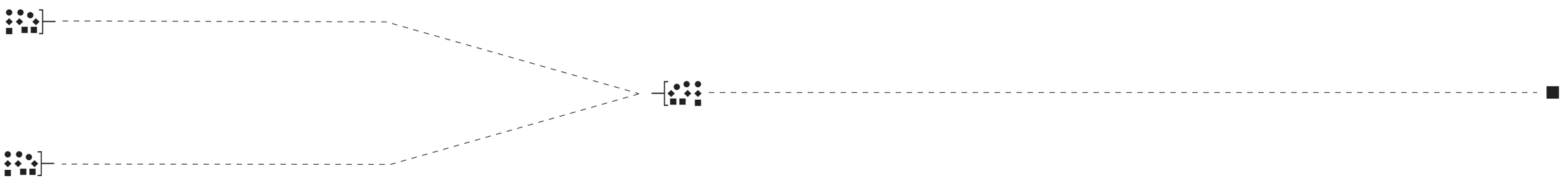
REDUCE GRAIN DENSITY & LENGTH

MIX CHIRPS, PUNCTURE, STORM, GRAINS

P < > F

AUTOSAMPLE THRESHOLD 50%

MODERATE HP & LP FILTERING



AUTOSAMPLE THRESHOLD 50%

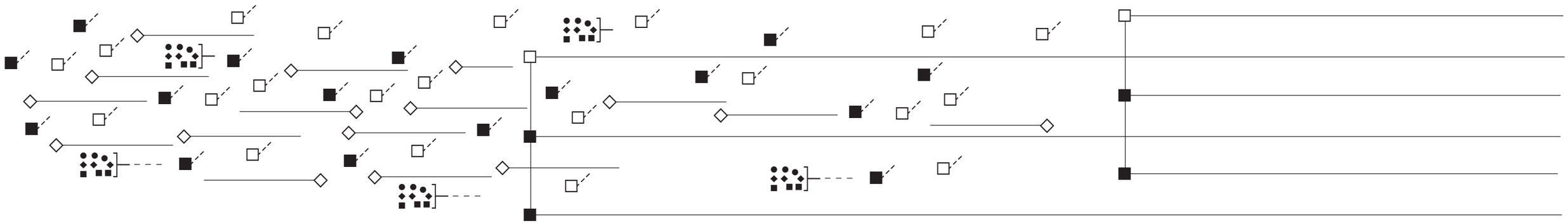
REDUCE GRAIN DENSITY & LENGTH

EXTREME BANDPASS FILTERING

INCREASING DENSITY & REDUCING POSITION JITTER TO OSCILLATION

MODERATE HP & LP FILTERING

11:00 11:10 11:20 11:30



INCREASING DENSITY

5

TRANSFORMER DRONE STEADY TRIGGERING

PP > FF

MODERATE HP & LP FILTERING

FADE OUT GRANULATOR

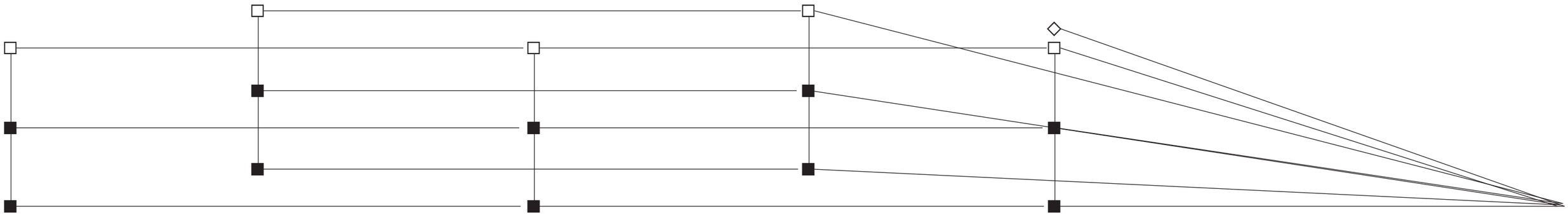
SAMPLE TO EZLOOPER E G

REDUCE GRAIN DENSITY & LENGTH

EXTREME BANDPASS FILTERING

FADE GRANULATION OUT

11:30 11:40 11:50 12:00



TRANSFORMER DRONE STEADY TRIGGERING

F > FF

MODERATE HP & LP FILTERING

FADE IN EZLOOPER

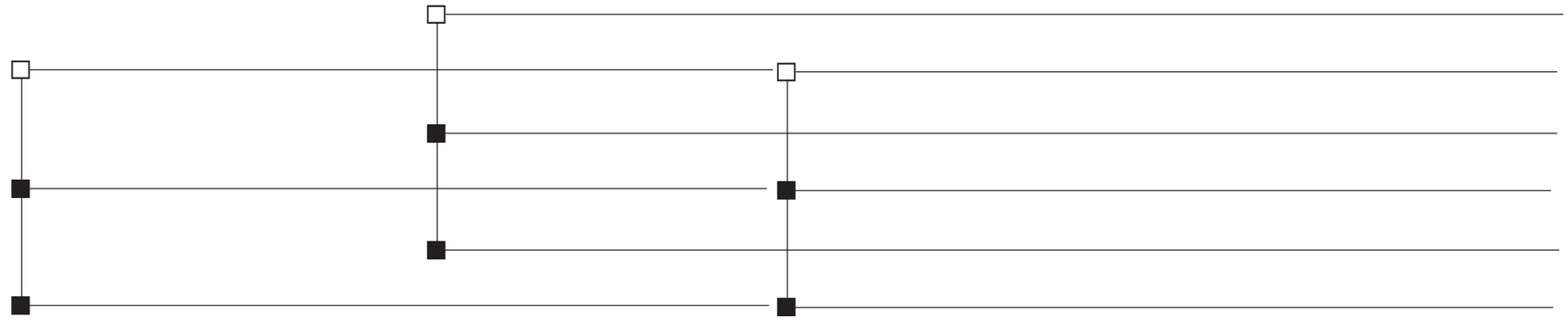
TUBE FEEDBACK

PP > FF

REDUCING LP FILTER CUTOFF

FADE OUT EZLOOPER

12:00 12:10 12:20 12:30



ALL SOUND FILTERED OUT

TRANSFORMER DRONE STEADY TRIGGERING

PP > FF

INCREASING LP FILTER CUTOFF

FADE IN EZLOOPER

2

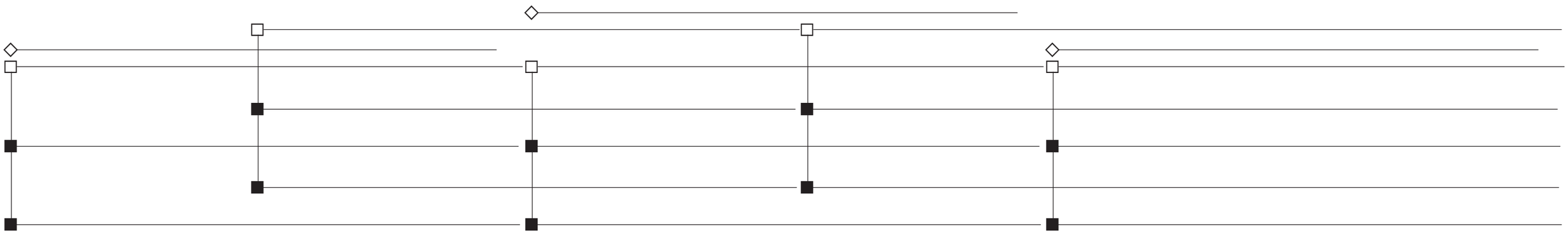
VLA HARM (1) (1) (2)
NTRL Gb6

F

VLA HARM (1) (1) (2)
NTRL Gb6

F

12:30 12:40 12:50 13:00



TUBE FEEDBACK

PP > FF

MODERATE HP & LP FILTERING

EZLOOPER CONTINUES

SAMPLE TO SLICER S

TUBE FEEDBACK

F > FF

MODERATE HP & LP FILTERING

EZLOOPER CONTINUES

VLA HARM (1)
NTRL Gb6

F

(2)
(3)

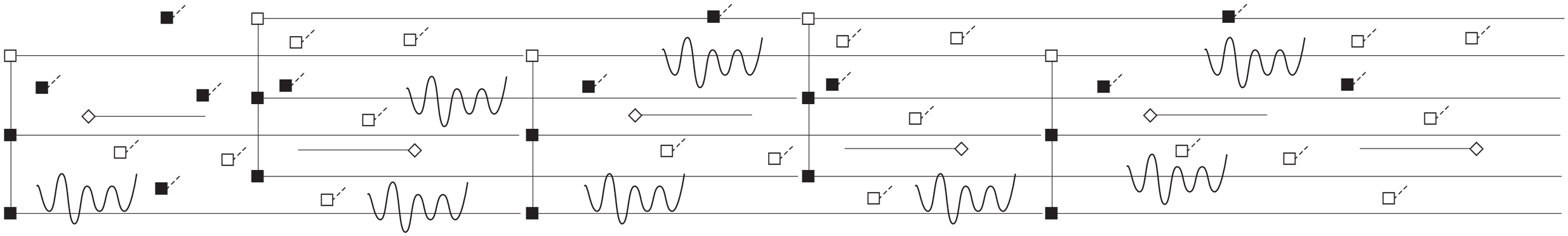
(2)

VLA HARM (1)
NTRL Gb6

F

(2)
(3)

13:00 13:10 13:20 13:30



PVOC & WACOM GESTURES

PP > FF

MODERATE HP & LP FILTERING

EZLOOPER CONTINUES

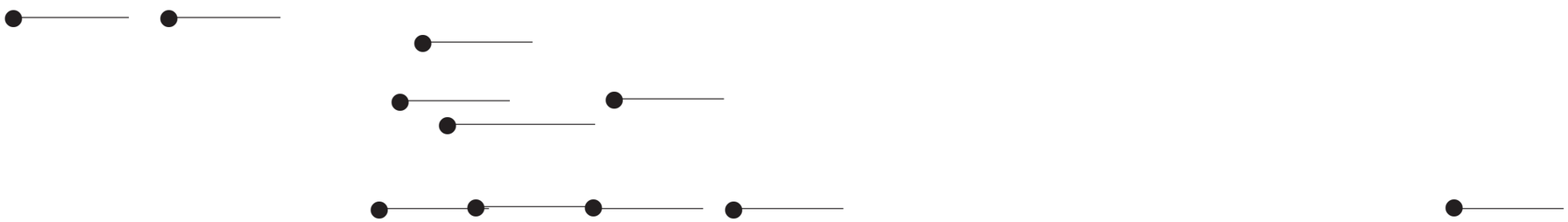
TURNTABLISM & TELEGRAPHING

CHOPPY

REDUCE EZLOOPER PLAYBACK RATE

FADE OUT PVOC

FADE OUT WACOM GESTURES



VLA HARM (1)
NTRL Gb6

F

(2) (3) HIGH
MID
LOW

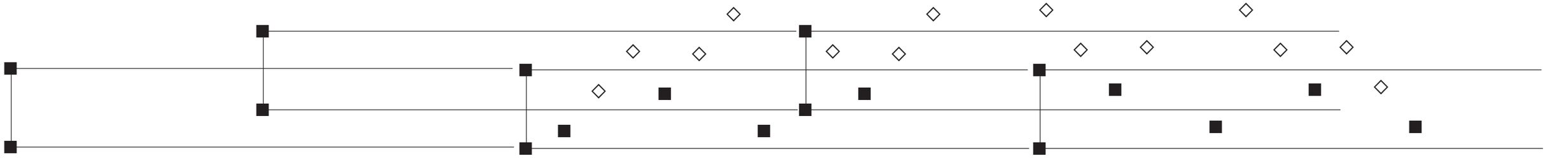
(2) (3)

(3)

(3)

@ 500MS INTERVALS

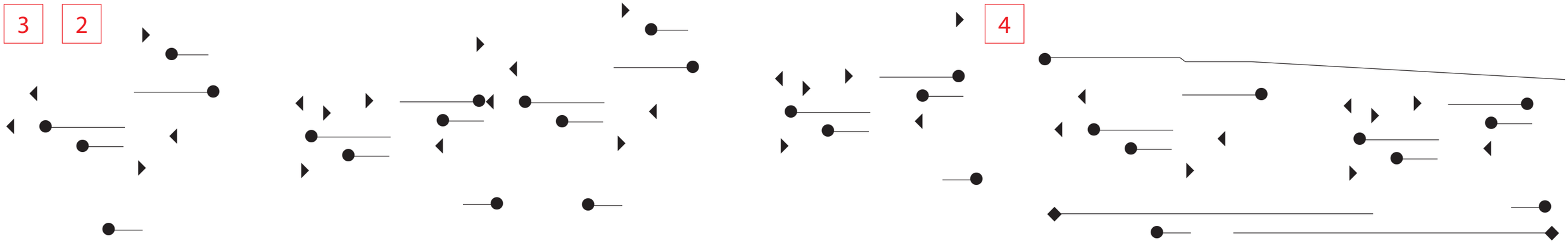
13:30 13:40 13:50 14:00



SET SLICER SEQUENCE & FADE UP SLICER

FADE DOWN EZLOOPER

MODIFY SLICER SEQUENCE



MIXED VLA & PIZZ FREE PITCH & DIRECTION, SHORT IRREGULAR BURSTS

P < > F

WACOMBUF PITCH DEVIATION 33%

SAMPLE TO EZLOOPER & GRANULATOR E G

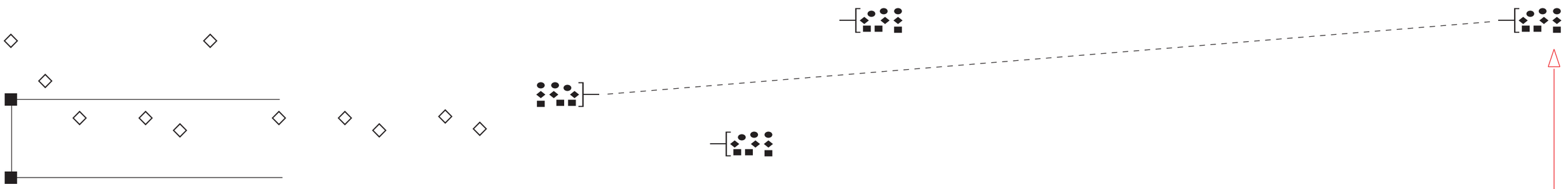
SPARSE TRUMPET & GONGS FREE DIRECTION

P < > F

WACOMBUF PITCH DEVIATION 0%

FADE UP EZLOOPER

14:00 14:15 14:30 15:00



MODIFY SLICER SEQUENCE

FADE OUT SLICER

FADE OUT EZLOOPER

GRANULATOR

PPP > F

DENSE, LONG GRAINS

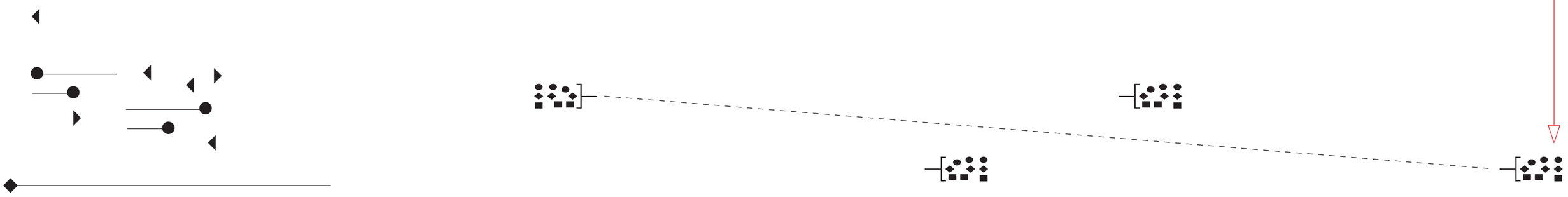
MODERATE HP & LP FILTERING

DECREASING DENSITY & LENGTH

INCREASING HP FILTER CUTOFF

SHARP CUT

PLAYERS
EXIT
TOGETHER



LARGE GONG

FF

FADE OUT EZLOOPER

GRANULATOR

PPP > F

SPARSE, SHORT GRAINS

MODERATE HP & LP FILTERING

INCREASING DENSITY & LENGTH

DECREASING LP FILTER CUTOFF

CUT

Mute | Solo

Fixed Media (6'43)

Submitted in part satisfaction of the requirements for the degree of PhD in the University of Edinburgh, 2011

Recording overview

Mute|Solo was created to be the last track on a compilation CD (*Encounters*, 2009) of short chamber works for string quartet, piano, and soprano. The work is included on the attached CD and is also available to download from http://www.pixelmechanics.com/mutesolo.

The composer was given access to all the recorded material for sampling, from which selections were edited and catalogued. At least one sample was chosen from every work, and used in this piece. Rather than presenting the material as a form of plunderphonic[1] juxtapositions and combinations, these selections were used as the basis of a series of extreme, realtime, wavetable manipulations, out of which phrases were again edited and catalogued.

In part the work was created as a response to the sliding and jittery gestures of Sciarrino's *Tre Notturni Brillanti* (1975). The final shape of the work was intuitively pieced together out of these phrase selections, with highlighted contrasts between relatively stable rhythmic treatments and more unstable granular approaches.

In *Mute|Solo*, sparse, percussive, and rhythmic fragments make way for rapid, slashing transformations of the sampled material. Untreated fragments occasionally surface and provide some respite from the intense digital grain. Though short, the composer considers this to be one of his breakthrough works.

Score overview

This listening guide[2] was created after the recorded work as an annotation to aid radio producers broadcasting a concert that featured a diffusion of *Mute|Solo*.[3]

The symbols used in the guide were devised by the composer to represent the character of the various sonic elements of the work, and the vertical axis is used to represent amplitude and/or frequency for the various elements.

mid/high frequency narrowband impulses

low/mid frequency broadband sample fragment

grainy/eroded event with duration in the range 250-750ms

high frequency event with exponential attack in the range 30-50ms

variable high frequency narrowband granular noise

low frequency accumulation of energy

mid/high frequency event with exponential amplitude and pitch decay (or attack) in the range 100-500ms

multiple narrowband strata impulses

variable mid frequency event with exponential attack and decay, with total duration in the range 50-100ms

granular combination of all previous short duration events

very high frequency (13-15kHz) sustained modulation tone

untreated sample

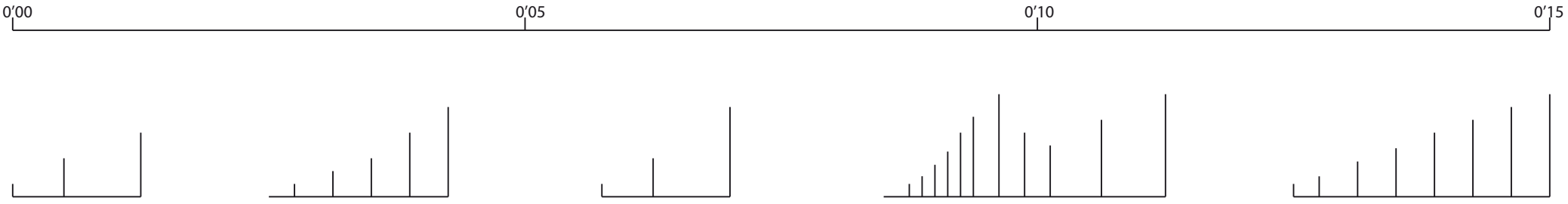
Notes

[1] Plunderphonics is a term coined by John Oswald to describe new works composed with fragments of existing recordings. For more information visit http://www.plunderphonics.com/

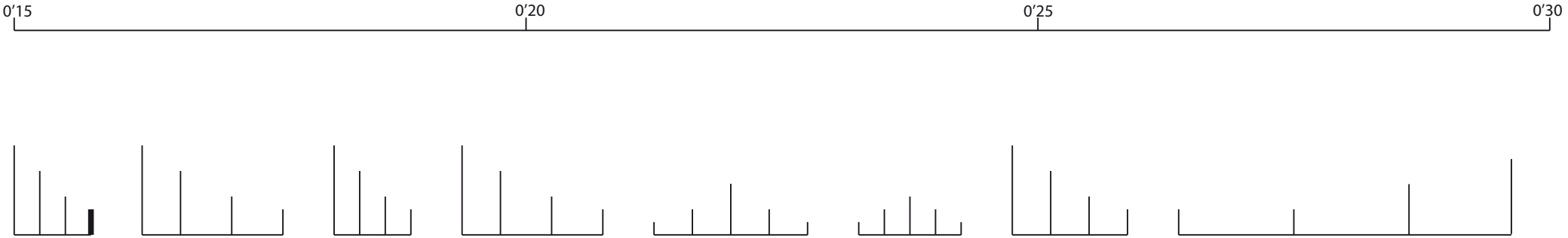
[2] The guide presented here was subsequently used, without changes, as a score to create an alternative, research based, realisation of the work that has been performed by laptop and modular electronics quartet on two occasions to date. At the time of writing there are no plans to perform the work again as a quartet. A video of one of the performances can be seen at http://www.vimeo.com/10255121 and is included on the attached DVD.

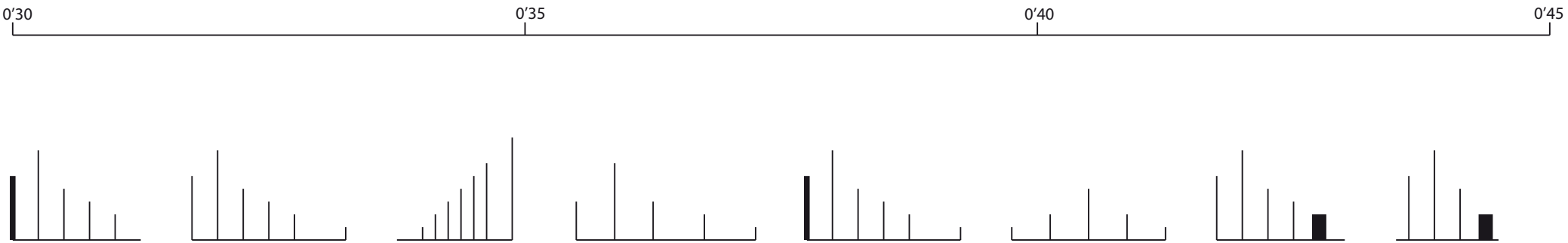
[3] The concert was broadcasted on BBC Radio 3, 24th October 2009. The work was diffused through a 'ghost' quartet equipped with SFX Technologies Gel Audio Transducers (http://www.sfxtechnologies.co.uk/SFX-Gel-Audio), with PA reinforcement.

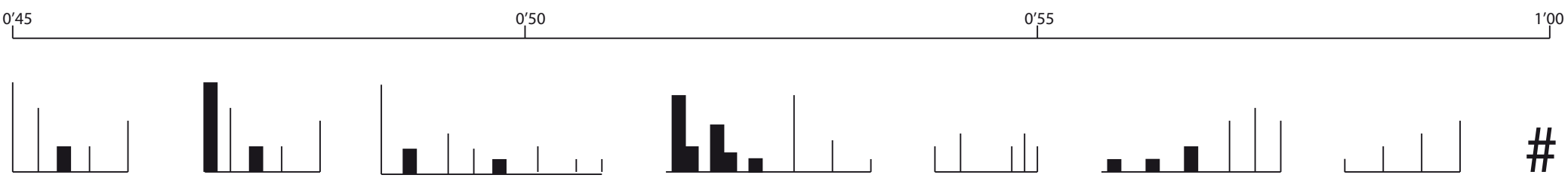
An image of the programme details and ghost quartet is included on the attached DVD (http://www.bbc.co.uk/programmes/b00nh60b, with permission).



Clicks







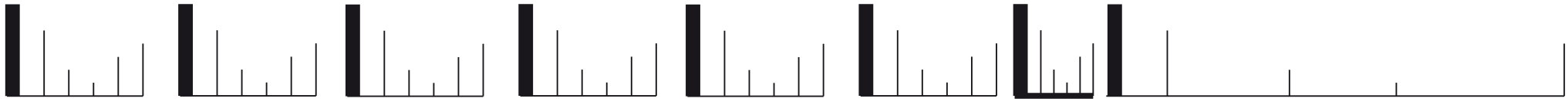
Clicks with sample fragments

Broken fragment

1′00 1′05 1′10 1′15

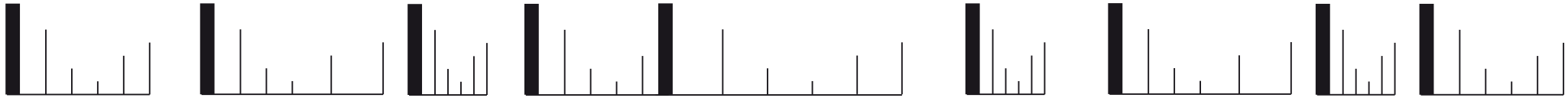
Regular phrase

1′15 1′20 1′25 1′30



Accel. > Decel.

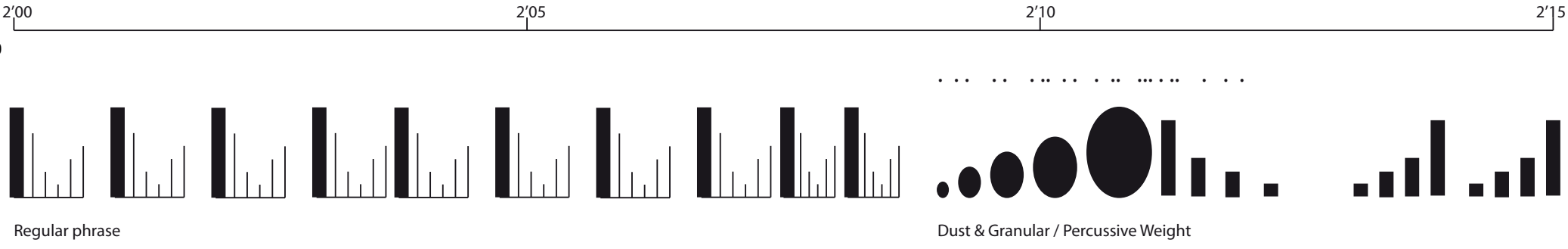
1′30 1′35 1′40 1′45

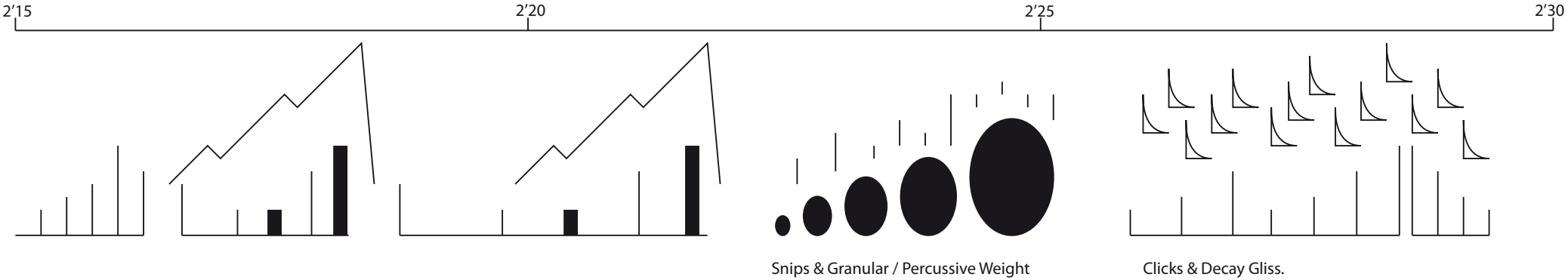


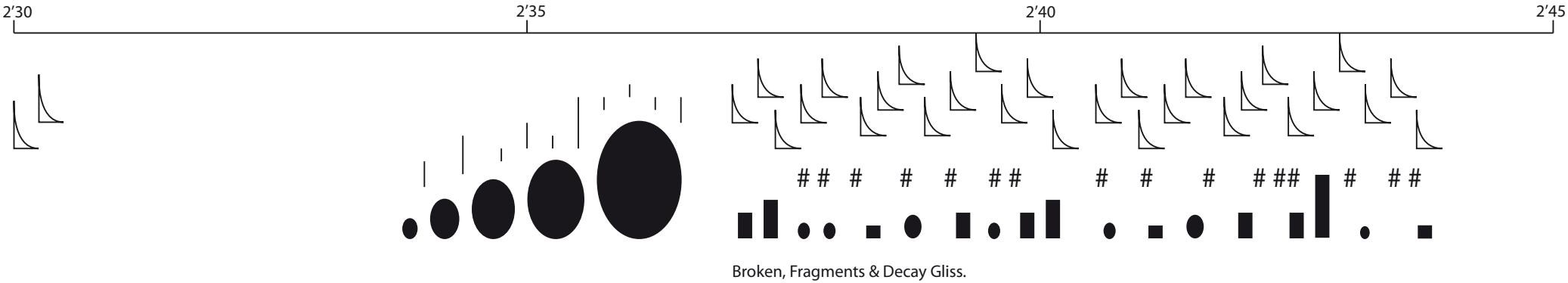
Modulating timing

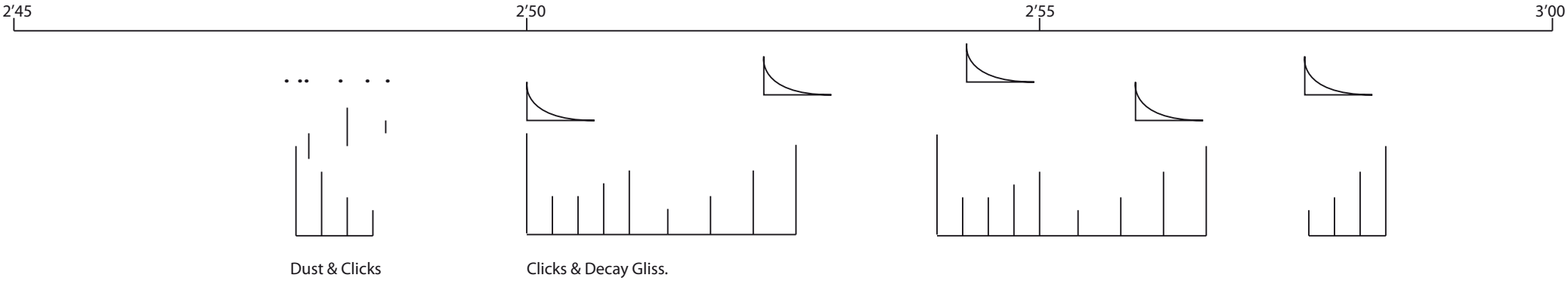
1′45 1′50 1′55 2′00

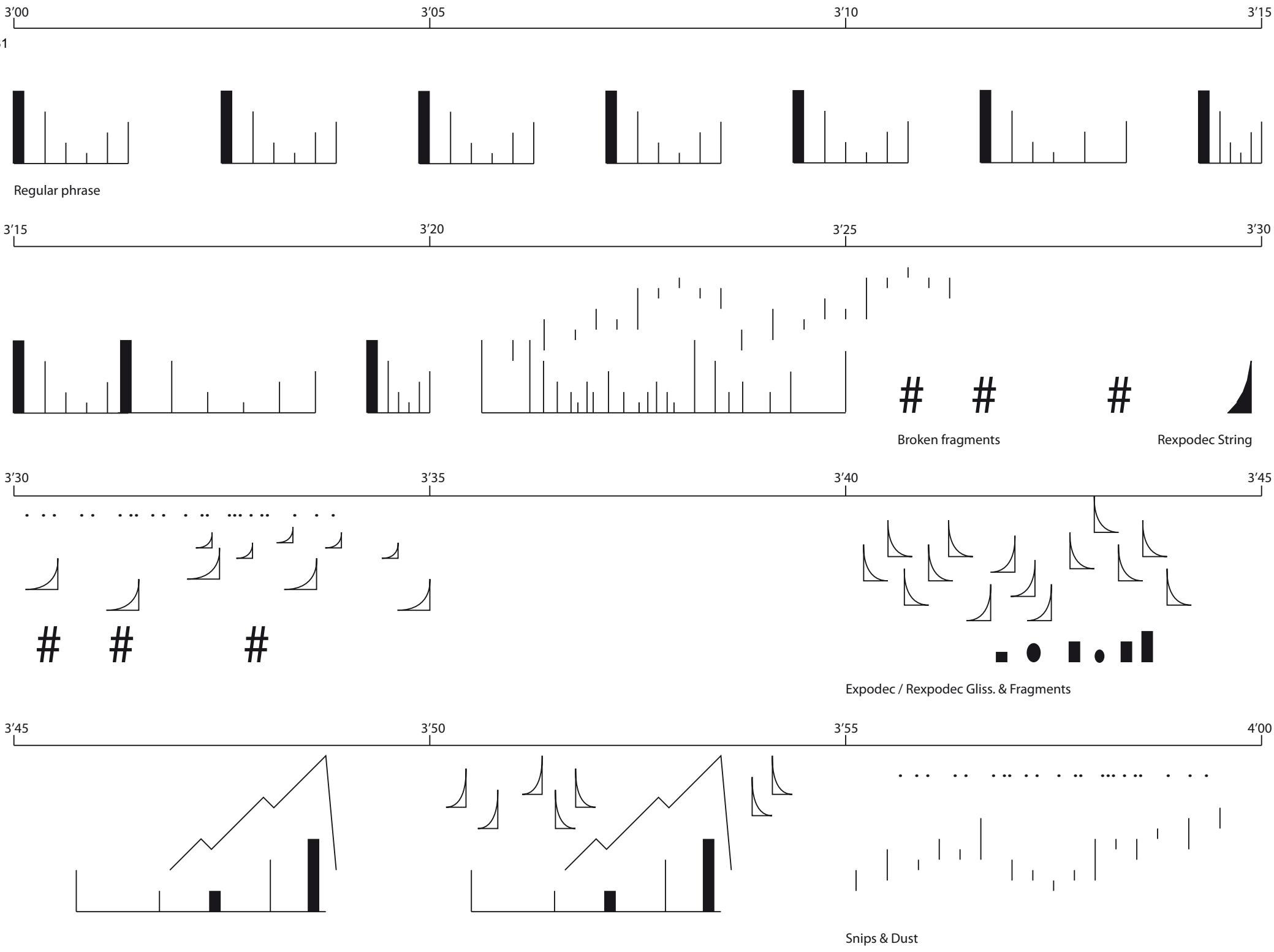
Irregular snips

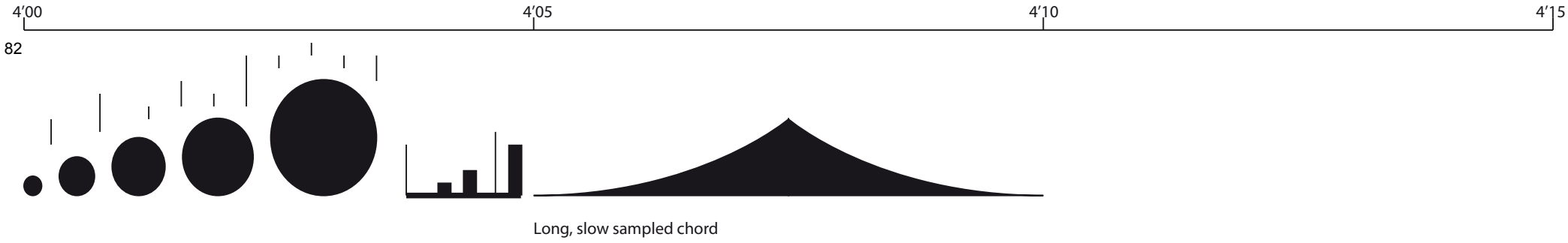

2′00
2′05
2′10
2′15
Regular phrase
Dust & Granular / Percussive Weight

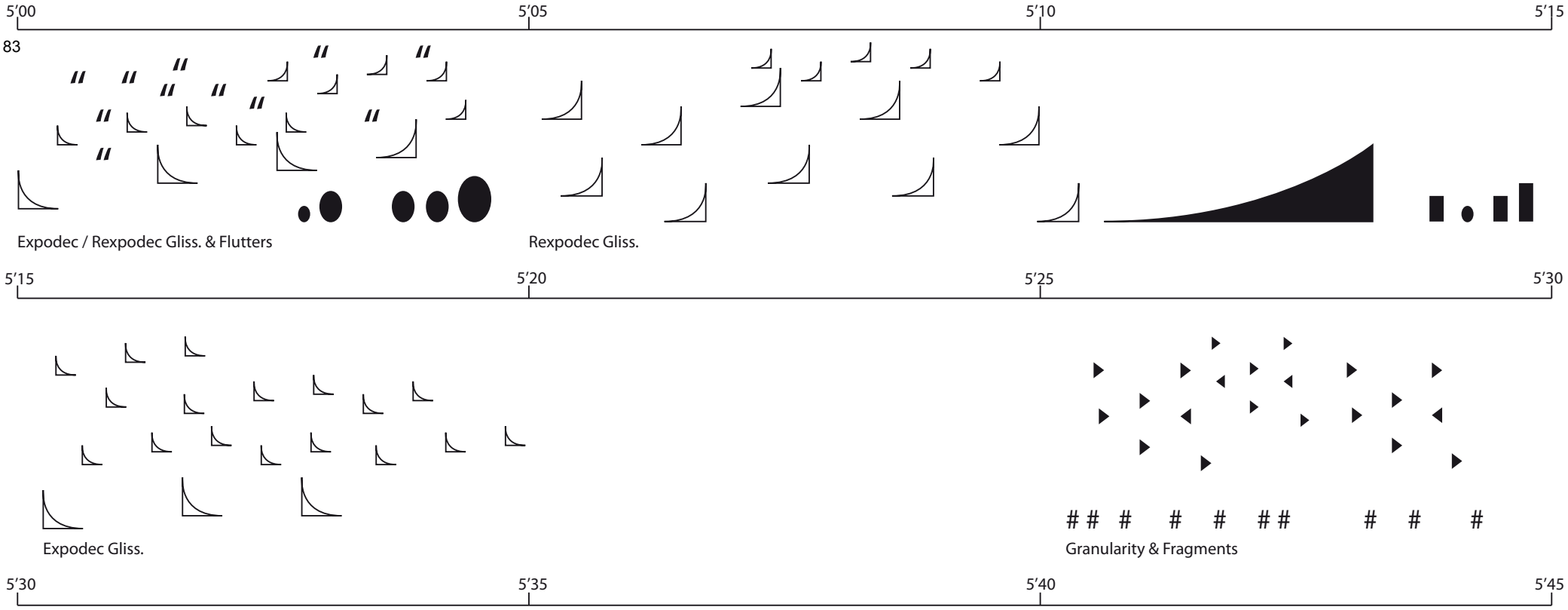

2′15
2′20
2′25
2′30
Snips & Granular / Percussive Weight
Clicks & Decay Gliss.

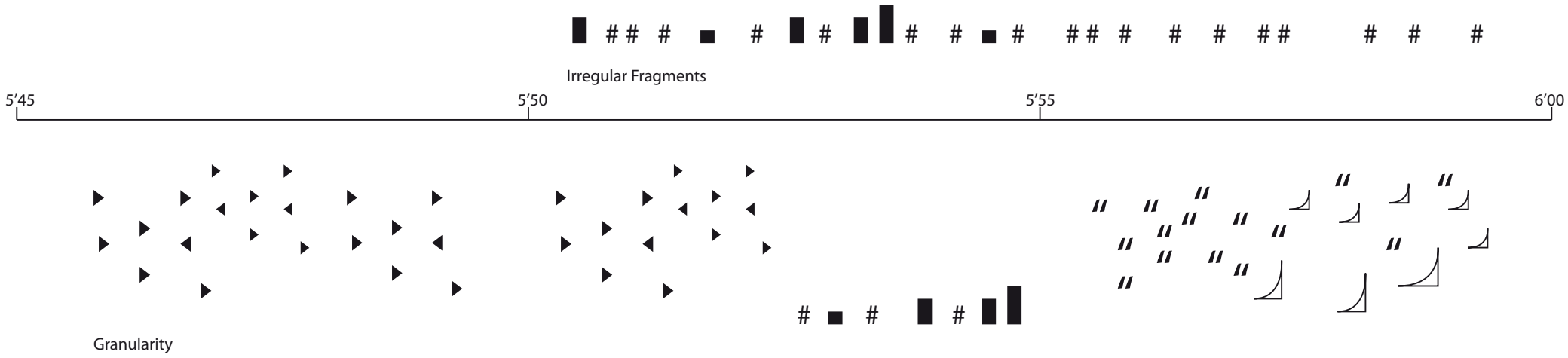

2′30
2′35
2′40
2′45
Broken, Fragments & Decay Gliss.

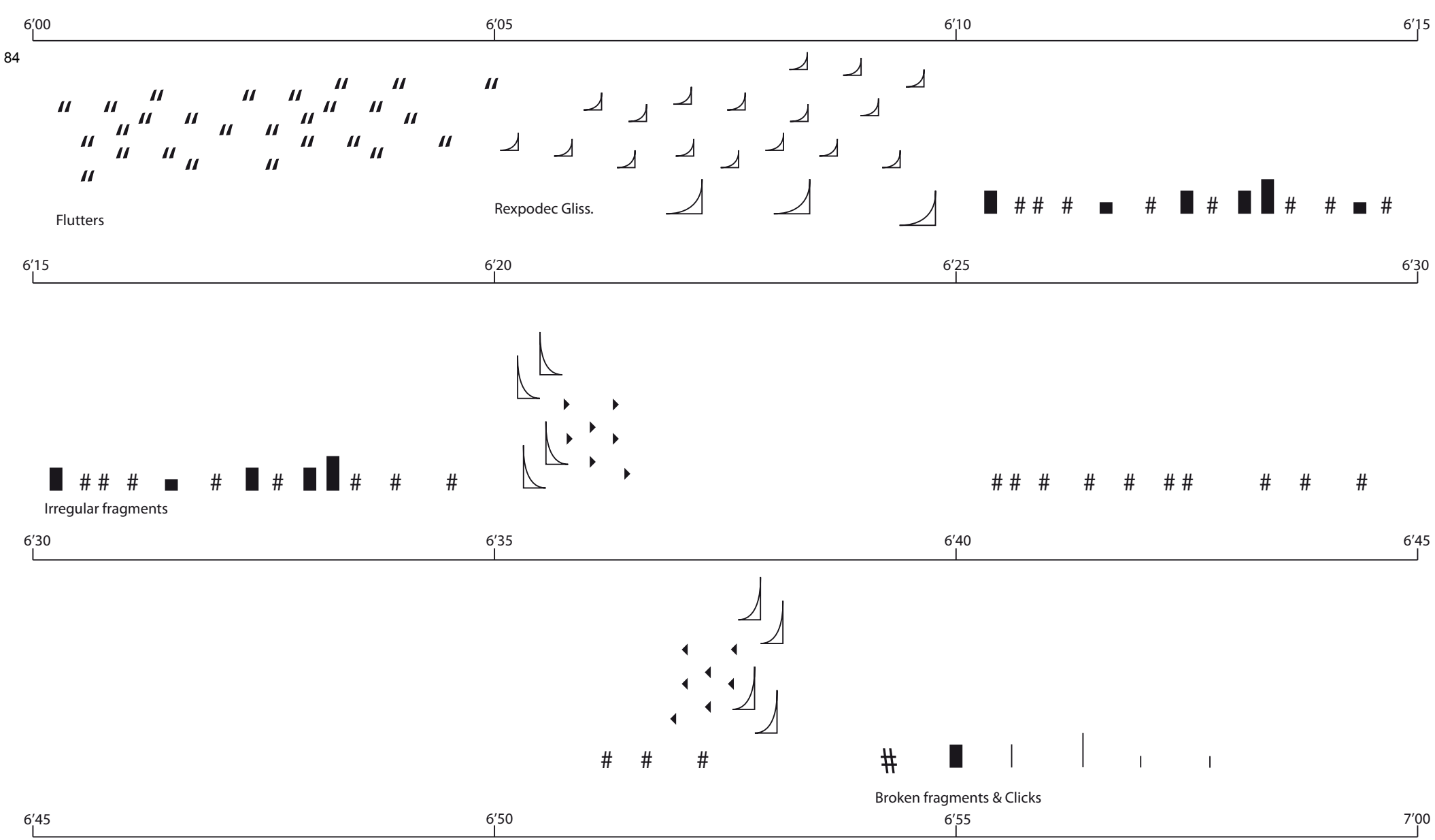

2′45
2′50
2′55
3′00
Dust & Clicks
Clicks & Decay Gliss.


3′00
3′05
3′10
3′15
Regular phrase
3′15
3′20
3′25
3′30
Broken fragments
Rexpodec String
3′30
3′35
3′40
3′45
Expodec / Rexpodec Gliss. & Fragments
3′45
3′50
3′55
4′00
Snips & Dust


4'00
4'05
4'10
4'15
Long, slow sampled chord
4'15
4'20
4'25
4'30
Irregular, quiet broken fragment
4'30
4'35
4'40
4'45
Irregular broken fragment
Louder broken fragments
Rexpodec sample
4'45
4'50
4'55
5'00
Granularity
Flutter
Fragments, Rexpodec Gliss & HF Modulation


5′00
5′05
5′10
5′15
Expodec / Rexpodec Gliss. & Flutters
Rexpodec Gliss.
5′15
5′20
5′25
5′30
Expodec Gliss.
Granularity & Fragments
5′30
5′35
5′40
5′45

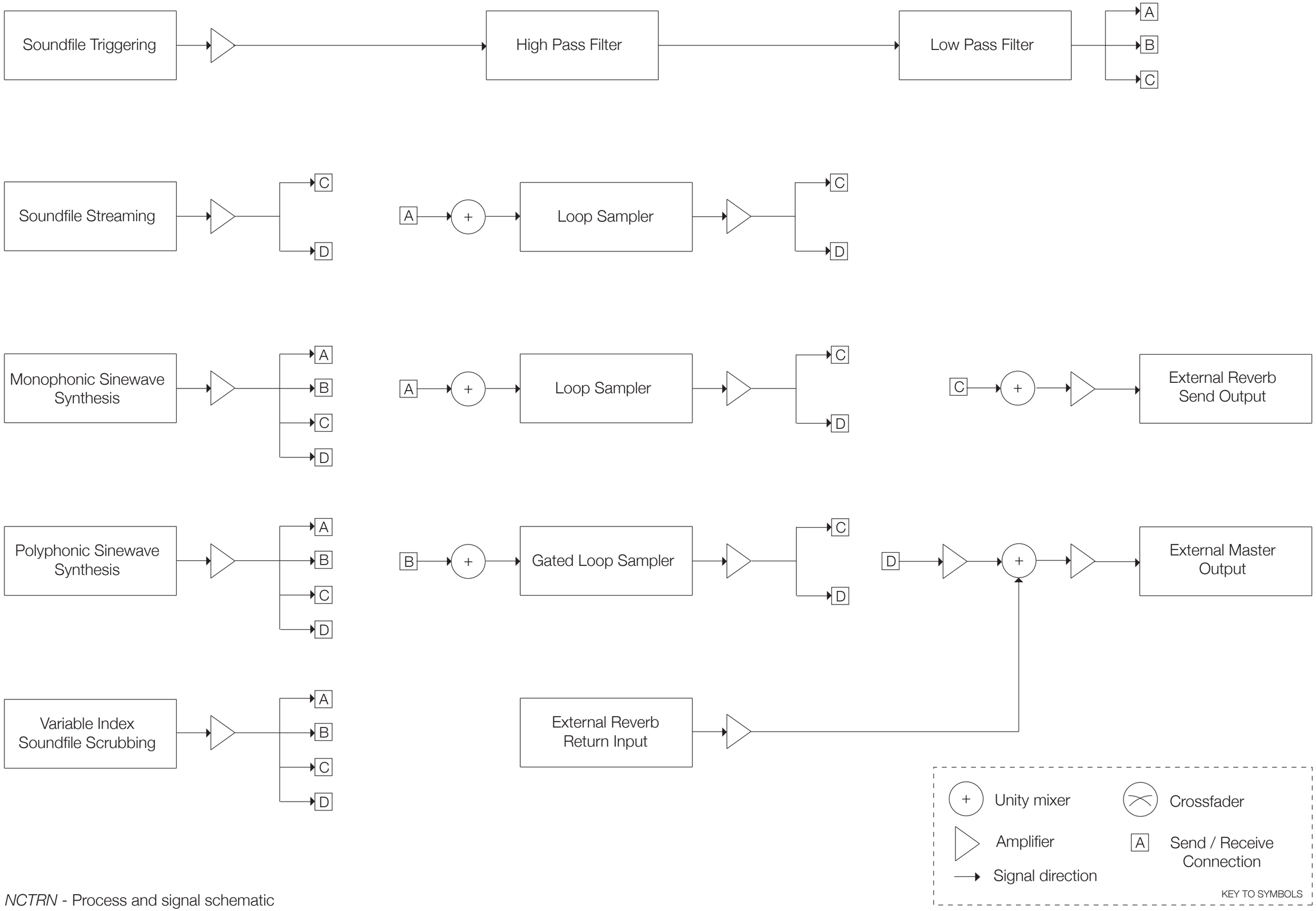

Irregular Fragments
5′45
5′50
5′55
6′00
Granularity


6′00
6′05
6′10
6′15
Flutters
Rexpodec Gliss.
6′15
6′20
6′25
6′30
Irregular fragments
6′30
6′35
6′40
6′45
Broken fragments & Clicks
6′45
6′50
6′55
7′00

NCTRN

Solo performer, laptop, and controllers (c. 9'00)

Submitted in part satisfaction of the requirements for the degree of PhD in the University of Edinburgh, 2011



NCTRN - Process and signal schematic

Performance note

NCTRN is a study of similarities between, and interpretive extensions of, the various repetitive and guttural churring and warbles that are typical of the European Nightjar, and extended flute trilling and whistling gestures performed by Sabine Vogel on *Aus dem Fotoalbum eines Pinguins* (2006, used with permission).

The work has a generally nocturnal character that is in keeping with its subject, but takes some bruitist turns. A recording of the work is available on the attached CD, and can also be downloaded from http://www.pixelmechanics.com/nctrn.

In performance, a pre-mixed soundfile provides a structural foundation for scored additions that expand upon the character of the pre-composed material. These additions are triggered and controlled by graphics tablet, 3d controller and MIDI devices.

The work's score uses a graphic notation that provides timing and sound type information to the performer, and an indication of sounding character in the pre-mixed file.

Alongside artist-approved flute samples, the work's sources include daf (Persian frame drum), trumpet, saxophone, and analogue modular synthesis. Triggered files are subject to further digital signal manipulation, in a manner reminiscent of both early tape works and modern turntablism.

Technical Setup

1 x 2 channel PA system
1 x Small format mixing board (Mackie 1202 or similar, minimum 4 input channels, 2 aux sends, and 2 outputs)
1 x High quality stereo reverb (Lexicon, TC Electronics or similar)
1 x Apple MacBook Pro Intel 2GHz or better running Cycling '74 MaxMSP 5
1 x High quality multichannel audio interface (RME Fireface, Metric Halo or similar, minimum 4 outputs channels)
1 x Wacom Intuos3 A6 (wide) graphics tablet
1 x 3d Connexion SpaceNavigator with installed drivers and aka.spacenavigator object
1 x (or more) MIDI controller(s) providing 24 faders / potentiometers (2 x Faderfox LV1 preferred)

NB. all processes and subpatchers (shown in parentheses) referred to below are contained in the main _jr.nctrn.maxpat MaxMSP file. More information on the processes can be found in the Instrument and Device guides section of this document.

1 x Soundfile triggering (jr.5.wacombuf) Polyphonic soundfile triggering with optional control of playback direction and attenuated random pitch/speed offset
1 x High pass filter (jr.5.simplesvf) 12dB/octave high pass filter
1 x Low pass filter (jr.5.simplesvf) 12dB/octave low pass filter
1 x Soundfile streaming (jr.5.qplay) Direct-from-disk soundfile streaming
1 x Sinewave synthesis (jr.5.monosine) Monophonic sinewave synthesis with track and hold frequency control, variable amplitude modulation and slewed decay
1 x Sinewave synthesis (jr.5.polysine) Polyphonic sinewave synthesis with variable amplitude modulation, and variable amplitude and decay time
1 x Soundfile scrubbing (jr.5.scratcher) Monophonic soundfile scrubbing with interpolating buffer index modulation and variable modulation rate
1 x Gated loop sampler (jr.5.gesture) Monophonic samping looper with gated output and variable playback speed and direction
2 x Loop sampler (jr.5.ezlooper) Looper with variable playback speed and direction

Score overview

The score provides information for the performer over multiple lanes, each appropriate to the sound types present in the work. The lanes illustrate the sonic nature of the material at any given time in terms of spectromorphology and variety of pitch and/or character. The lanes also indicate timing for triggering soundfiles and sampling to devices, and outline a target gestural character that may vary with performer accuracy.

The top-to-bottom order of the lanes SINE to DAF coincides with the left-to-right layout of the sound library (jr.5.wacombuf) and synthesis (jr.5.polysine and jr.5.monosine) functions on the graphics tablet. The QPLYR lane illustrates the timing and character of the pre-mixed file and does not require any actions other than setting an initial level and starting playback (jr.5.qplay).RMS amplitude of the pre-mixed file is also shown as a waveform in the GNRL lane, with some comments on passage character.

The EZLPR and WGSTR lanes refers to resampled output (jr.5.ezlooper and jr.5.gesture). No specific pitch references are marked for WGSTR as output is a function of sounds triggered elsewhere, although a gate length is indicated.

A printable reference showing the layout of sound types on the tablet is provided in the extracted software distribution, and marks some specific trigger points for trumpet air streams and high frequency sine waves. This reference should be attached to the graphics tablet for performance.

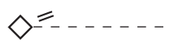
Throughout the score, the lanes provides some instruction as to type, depth, and/or range of modulation/processing, and dynamic levels. In some cases dynamic range should be treated as a variable parameter falling between two limits, e.g. pp < > ff means "some value between" pp and ff.

The score employs a notation based on the Sonova font developed by Lasse Thoreson and Andreas Hedman (2007, 2007, 2010), and includes some symbols devised by the composer (marked * in the following key) that aid score following. The following section shows how symbols are used in this work.


sine / flute whistle tone


sine chirrup

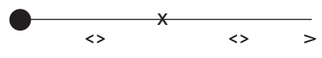

trumpet air stream


flute flutter tongue

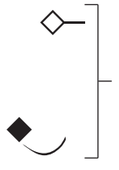

flute tongue ram


percussive sound event


nightjar churring

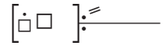


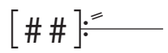
frame drum with retrigger (x) and gesture marks

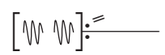

combined tongue ram / air stream gesture

sound types should be played as quickly as possible together


granular accumulation


fluttering narrow band percussive repetitions


broadband noise repetitions *


watery modulating repetitions *


mixed pitched / percussive gesture


mixed pitched gesture

trigger sampling object indicated by key
(defaults W = jr.r.gesture, E & Z = jr.5.ezloopers)

Computer Setup

The MaxMSP patches, externals and soundfiles required to perform the work can be downloaded from http://www.pixelmechanics.com/nctrn, or copied from the attached DVD. The directory structure should be left intact after extraction and the root directory should be added to the MaxMSP search path with Subfolders option checked. (NB. to avoid external and abstraction conflicts only one root folder from Jules Rawlinson's works should be added to the MaxMSP search path at a time.)

The _jr.nctrn.maxpat MaxMSP file hosts all the instruments and processors used to perform the work as bpatchers (modular devices with GUI).

Two sets of stereo outputs are provided in the patch, one for the main output, and another which can be configured as a pre-fader send to the external reverb unit. This configuration provides an easy way to generate a wet/dry balance in performance. Reverberation levels should be set as required to add ambience to the final output and mask the dry, closely recorded character of the sample library.

The performance patch _jr.nctrn.maxpat has been been designed to automatically load a controller mapping preset and all soundfiles into the appropriate instruments. Soundbank folders can also be dropped into instruments if necessary.

MIDI and key mappings can be re-configured and saved as required for the performers individual setup using drop-down boxes and assignment abstraction on individual bpatchers and sub-patcher "sends.controls".

Where MIDI preset mapping is not available, MIDI note and controller numbers are indicated as these can often be configured on the MIDI device. Instructions for mapping and saving MIDI and keystroke information can be found in the subpatcher "sends.controls" in _jr.nctrn.maxpat.

A number of sample triggering, sampling, and synthesis instruments and effects are provided that can be mixed and processed as appropriate to the character of the performance. The devices are equipped with inputs for mapping parameters to controller devices and some devices offer additional on-screen controls.

The Wacom graphics tablet bpatcher devices are equipped with a toggle for turning on/off controller data coming from the device in the device GUI. As multiple instruments can be active, interesting layers of sound can be achieved with the performer's focus and intention shifting between instruments.

Instrument guide and special cases

jr.5.wacombuf

This instrument is played with the Wacom graphics tablet and triggers short soundfiles, which can be post-processed with high and low pass filtering. The score does not generally indicate specific soundfiles to be triggered, but instead suggests a type of file.

Soundfiles are mapped onto the X axis, and soundfile amplitude is mapped onto the Y axis. Reverse playback can be triggered by holding down the tip switch.

Overall amplitude control sits between the instrument and post-processing, and a control input is provided for attenuating randomised re-pitching of the sample. Output from this instrument is sent to the main output and looping instruments.

jr.5.qplay

This device streams playback of a single soundfile from disk, and for this work is responsible for playback of the (automatically loaded) pre-mixed part. The device includes an elapsed time display, and an input for jumping to a specific minute in the file.

On-screen transport controls are provided for loading, playing (and resuming), pausing, and resetting the soundfile. Amplitude controls are also present in the device. The bpatcher is equipped with inputs for mapping keystrokes to transport controls, and for mapping a controller to amplitude. Output from this device is sent to the main output.

jr.5.gesture

This instrument is played with the Wacom graphics tablet and provides gated looping of sampled input with variable speed and direction. Speed and direction are mapped to the X axis (-2 to 2 times original playback rate at the tablet extremes) and amplitude is mapped to the Y axis.

Control inputs are provided for recording trigger and overall output level. A sustained loop can be achieved by toggling-off this device on the MaxMSP interface while the stylus is still touching the tablet.

This instrument sends output to the main output and looping instruments.

jr.5.scratcher

This instrument is played with the 3d Connexion SpaceNavigator, and produces clicks, broadband noise and percussive events through to pitched material and turntablist effects by modulating sample playback via another buffer.

The wave contained in the modulating buffer can interpolate from a Gaussian bell curve (resulting in forwards-backwards sample playback) through to a single repeating click at the other extreme of the control. When the instrument finishes one cycle of modulation another soundfile is chosen at random for the next cycle.

The SpaceNavigator offers up to six degrees of freedom, allowing multiple controls to be mapped to a single device. The mappings used in this work are:

Downward pressure - amplitude,
Sideways left rotation - high pass filter cutoff frequency
Sideways right rotation - low pass filter cutoff frequency
Forwards / backwards roll - modulation frequency

Two other control inputs are provided for modulation interpolation, and attenuation of modulation frequency, which allows more of the original sound to be perceived. Overall amplitude control is situated in an external gain control bpatcher (jr.5.gainmetersml~).

This instrument sends output to the main output and looping instruments.

jr.5.ezlooper

This instrument is played with a midi controller and provides a sustained loop of sampled input with variable speed and direction. Control inputs are provided for speed / direction (-1 to 1 times original playback rate at the tablet extremes), recording trigger and overall output level.

The composer's preference is for speed and direction to be mapped to a high quality midi-enabled crossfader such as those found on Faderfox controllers, affording rapid and precise changes in speed and direction that produce effects similar to turntablism.

Output from this instrument is sent to the main output.

jr.5.polysine

This polyphonic instrument is used in the first half of the work, from 0'20 to 5'00, and shares a score lane with jr.5.monosine.

Control of this instrument is limited to a section of the graphics tablet. Frequency is exponentially mapped to the X axis, and amplitude is mapped to the Y axis.

Control inputs are provided for depth of (fixed frequency) amplitude modulation, amplitude attack and decay time, and overall output level. Output is sent to the main output and looping instruments.

For this performance amplitude modulation depth is fixed at 100%, and amplitude attack and decay are fixed at 5 seconds.

A target frequency position (c. 12.5kHz) is marked on the printable reference guide.

jr.5.monosine

This monophonic instrument is used in the final quarter of the work, from 7'00 to 8'30, and shares a score lane with jr.5.polysine.

Control of this instrument is limited to a section of the graphics tablet. Frequency is exponentially mapped to the X axis, amplitude modulation frequency is mapped to the top half of the Y axis, and amplitude and amplitude modulation depth are non-linearly mapped to the Z axis (pressure).

Control inputs are provided for amplitude slewed fall time (up to 10 seconds), and overall output level. Output from this instrument is sent to the main output and looping instruments.

For this performance slewed fall time is fixed at 0 seconds.

Target frequency range (c. 10kHz to 14kHz) is marked on the printable reference guide, and the short chirrups should be played with a small curving upwards motion from left-to-right.

Thoreson, L. and Hedman, A. (2007) *Spectromorphological analysis of sound objects: an adaptation of Pierre Schaeffer's typomorphology*, in Organised Sound 12(2): 129-141

Thoreson, L. and Hedman, A. (2009) *Sound-objects, Values and Characters in Åke Parmerud's Les objets obscurs, 3rd Section*, in Organised Sound 14(3): 310-320

Thoreson, L. and Hedman, A. (2010) *Form-Building Patterns and Metaphorical Meaning*, in Organised Sound 15(2): 82-95

The composer would like to thanks Lasse Thoreson and Andreas Hedman for their help with the Sonova Font. http://www.spectromusic.com/

Vogel, S (2006) *Aus dem Fotoalbum eines Pinguins*, creative sources rec., Lisbon

The composer would like to thank Sabine Vogel for allowing sample use in this work. http://www.sabvog.de/

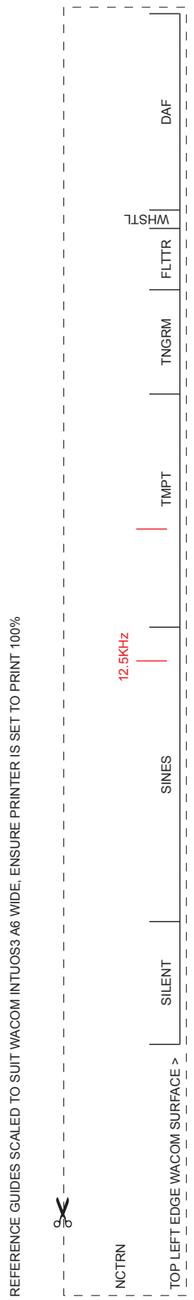
The following MaxMSP externals and abstractions are included in this software distribution for convenience, with source and author(s) noted below:

aka.spacenavigator - http://www.iamas.ac.jp/~aka/max/
(Masayuki Akamatsu)

mp.assignment - http://www.tinpark.com/category/research/software/
(Martin Parker)

mp.grainwindow~ - http://sd.caad.ed.ac.uk/maxhelp/2010/11/mp-grainwindow/
(Martin Parker)

wacom - http://cnmat.berkeley.edu/downloads
(Jean-Michel Couturier, Richard Dudas, and Michael Zbyszynski)



0

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE FADE UP JR.5.POLYSINE 50%

TMPT FADE UP JR.5.WACOMBUF 66%

TNGRM

FLTTR

WHSTL

DAF

SCRT FADE UP JR.5.SCRATCHER 66%, INTERP 100%, FRQ ATTN 100%, HIGH PASS FILTER 100%

QPLAY SET JR.5.QPLAY -6dB, PLAY

EZLPR

WGSTR

GNRL REFLECTIVE

93

0

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

pp

QPLAY

mf <> >

mp <> *mf* <> >

mf <> <> <> >

EZLPR

WGSTR

GNRL

1

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

QPLAY

EZLPR

WGSTR

GNRL

p

mf

mf

ff

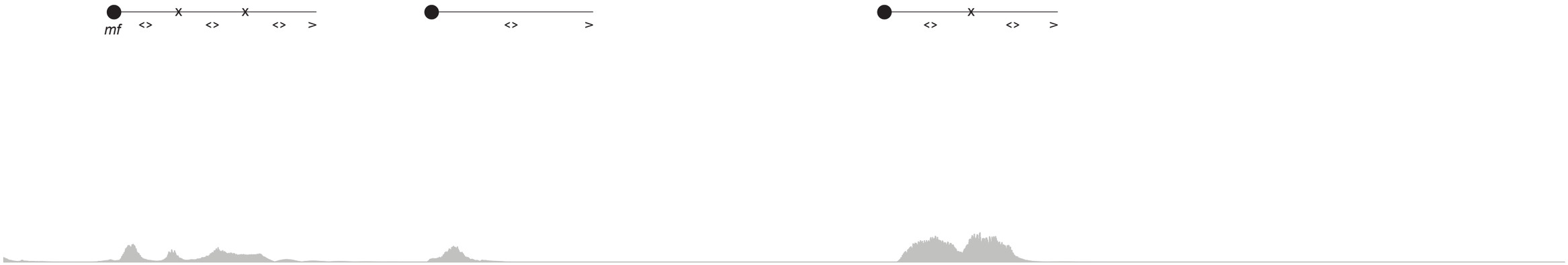
pp

mf

<> x x <> <> >

<> >

<> x <> >



1

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

TMPT

mf *mf*

TNGRM

ff *mf*

FLTTR

WHSTL

f

DAF

SCRT

QPLAY

<> x <> >

<> x <> >

mp <> x *mf* <> >

<> x <> >

EZLPR

WGSTR

GNRL

2

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

QPLAY

EZLPR

WGSTR

GNRL

p

mf

ff

f

f

f

mf

mp

<> >

<> <> <> >

W

2

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

TMPT

mf

TNGRM

FLTTR

WHSTL

f

DAF

mf

SCRT

pp

f

mf

pp

QPLAY

mf <> >

p <> >

mf <> >

<> >

EZLPR

WGSTR

GNRL

3

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT FADE UP 75%

TNGRM

FLTTR

WHSTL

DAF

SCRT FADE UP 75%, INTERP 50%,
FRQ ATTN 50%, HIGH PASS FILTER 100%

f *ff*

QPLAY

EZLPR

mp <> x <> >

WGSTR FADE UP JR.5.GESTURE 75%

GNRL LAYERED, INTERMITTENT, GESTURAL

3

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

p

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

QPLAY

mp <> x <> >

pp <> x <> >

EZLPR

WGSTR

GNRL

100

4

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT

f

TNGRM

FLTTR

WHSTL

f

mf

DAF

f

SCRT

ff

mp

QPLAY

<> >

EZLPR

WGSTR

GNRL

4

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

p

FADE OUT JR.5.POLYSINE

TMPT

f

TNGRM

FLTTR

WHSTL

f

DAF

mp

SCRT

ff

mp

f

QPLAY

EZLPR

WGSTR

FADE CUT JR.5.GESTURE

GNRL

5

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

mp

mp ff

INTERP 0 < > 100%, FRQ ATTN 50 < > 100%, HIGH PASS FILTER 50%

QPLAY

pp f pp pp f

mf <> > <> > mp <> mf <>

EZLPR

WGSTR

GNRL

LAYERING, COUNTERPOINT, INCREASING DENSITY

E Z

5

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

ff

INTERP 100%, FRQ ATTN 100%, HIGH PASS FILTER 0%

INTERP 0%, FRQ ATTN 100%, HIGH PASS FILTER 0%

QPLAY

pp

pp *f* *pp*

mp *mf*

mf

EZLPR

WGSTR

FADE UP JR.5.EZLOOPERS 75%

GNRL

DENSE COUNTERPOINT

6

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

INTERP 100%, FRQ ATTN 100%, HIGH PASS FILTER 0%, FADE OUT

QPLAY

f

pp

pp *f* *pp*

mf <> <> <> > <> > <> <> >

EZLPR

FADE OUT JR.5.EZLOOPERS

WGSTR

GNRL

REDUCED DENSITY COUNTERPOINT

105

6

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

FADE UP JR.5.MONOSINE 50%

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

QPLAY

f

f

mp <> *mf* <> >

EZLPR

WGSTR

GNRL

7

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

FADE TO 66%, INTERP 50%,
FRQ ATTN 50%,
HIGH PASS FILTER 50%

QPLAY

P

EZLPR

WGSTR

GNRL

107

7

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

SCRT

p *mf* *f*

INTERP 100%,
FRQ ATTN 100%,
HIGH PASS FILTER100%

QPLAY

EZLPR

WGSTR

GNRL

8

:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SINE

TMPT

TNGRM

FLTTR

WHSTL

DAF

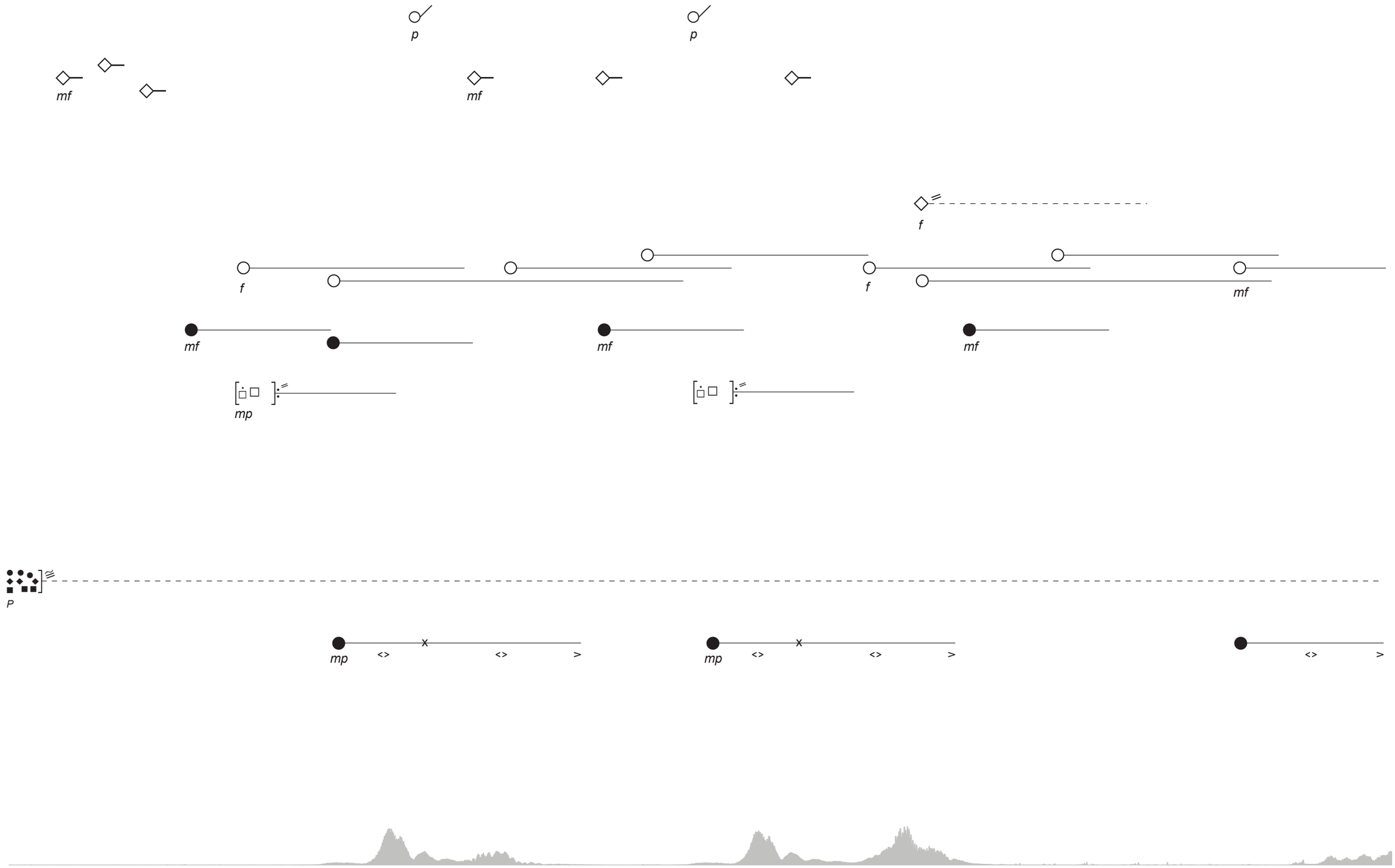
SCRT

QPLAY

EZLPR

WGSTR

GNRL



8

:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

SINE

TMPT

mf *mf*

TNGRM

FLTTR

f

WHSTL

f *f* *mf*

DAF

mf *mf*

SCRT

mp *mf* *mp* *p*

QPLAY

mp *mf*

pp

EZLPR

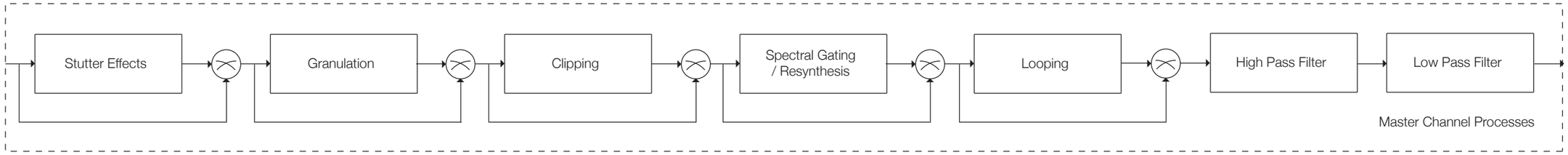
WGSTR

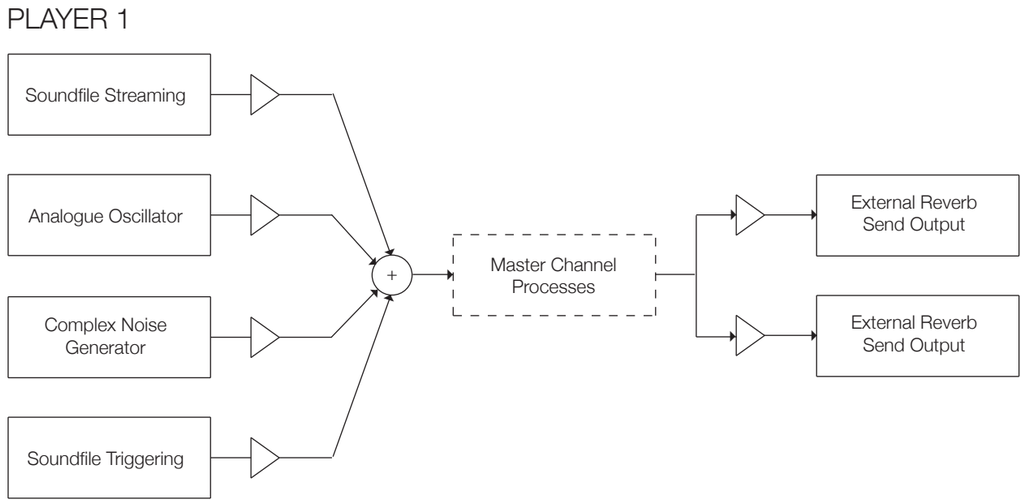
GNRL

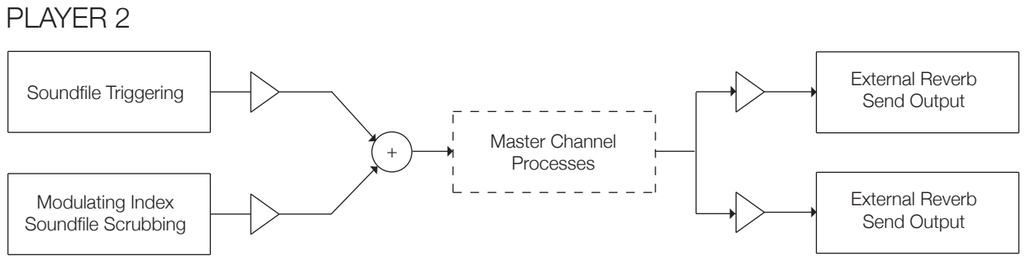
Radio | Silence

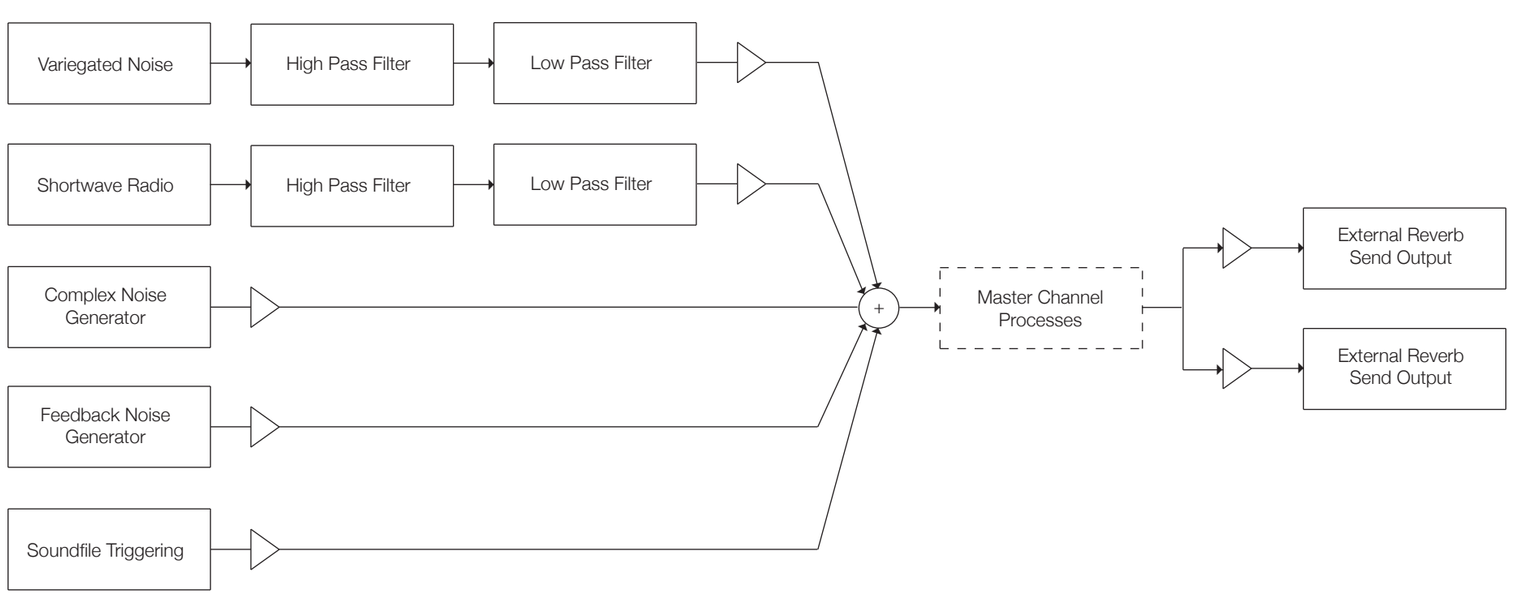
Three performers, laptops, controllers, and electronics (c. 17'00)

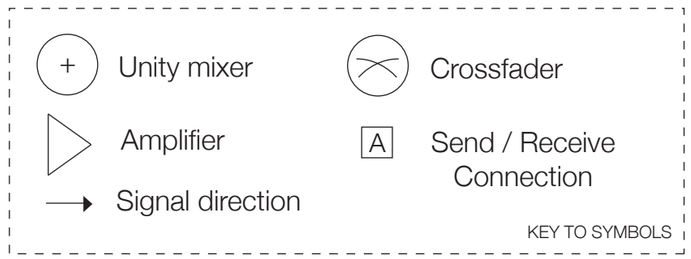
Submitted in part satisfaction of the requirements for
the degree of PhD in the University of Edinburgh, 2011











Radio | *Silence* - Process and signal schematic

Performance note

Radio | Silence is a composition for three performers, laptops, controllers, and electronics.

A recording of the work is available from http://www.pixelmechanics.com/radiosilence, and is also included on the attached CD. Performers should familiarise themselves with this recording as preparation for live performance. The original studio guide is also available as alternative reference.

The work is characterised by crash-edit interactions of solo gestures and combined sound events consisting of modulated electronics, variegated broadband and filtered noise, shortwave radio manipulations, concrete fragments, and turntablist treatments.

Variegated (a term more generally applied to botanics) noise is used here to describe sound that exhibits an irregular, patchy and streaked character comprising broad and narrow band noise in different colours, resembling the crackling static and dead air found while scanning between shortwave radio stations.

Perfomance requires three players with defined roles. Player 1 should adopt the role of conductor, and is responsible for soundfile cues, soundfile fragments, frequency modulated chirps, and variegated noise generated by modular electronics or laptop. Player 2 is responsible for percussive rhythmic cells and flutters, turntablist style gestures, and soundfile fragments. Player 3 is responsible for modular electronic and laptop generated variegated noise, shortwave radio manipulations, and soundfile fragments.

This score is supplied as a general guide to the organisation and structure of events rather than to provide instruction on how to achieve specific sonic details. While some attempt has been made to create, describe and notate useful, repeatable, gestural controls, the random processes employed in the supplied software instruments and the instability and variable tolerances of the analogue electronics used to perform the work means that some indeterminate outcomes are inevitable, and, in fact, desirable.

Player entry and exit actions should be observed as strictly as possible in order to preserve solo and combination character and contributions. Filter and amplitude controls are incorporated into supplied Max for Live instruments, but performers may choose to add further expression to their contributions by additional variable width filtering, dynamic control and limited reverberation.

The second half of the work is less rigidly scored than the first, with longer sections that provide opportunities for playful, more fluid signal processing of material using a selection of supplied Max for Live patches that provide the following: stuttering; granulation; clipping and erosion; fft based manipulations; and variable speed and direction looping.

These actions should occasional and subtle, reflecting the way they are used in the reference recordings and remaining within the character of the reference versions.

Technical requirement

Common:

1 x 2 channel, full frequency PA system
1 x Mackie 1202 small format mixing board (or similar, minimum 12 inputs, 2 aux sends/returns, 2 outputs)
1 x High quality stereo reverb such as Lexicon PCM or TC Electronics unit (optional)

Each player:

1 x Apple MacBook Pro Intel 2Ghz or better running Ableton Live 8 with Ableton/Cycling 74 Max for Live
1 x High quality multichannel audio interface such as RME Fireface or Metric Halo
1 x Velocity sensitive midi controller offering a minimum of 8 potentiometers

Player 1:

1 x Analogue Systems RS95 modular oscillator (or similar oscillator capable of generating 12KHz wave with waveshaping between triangle and sawtooth output and 2 pitch CV ins)
1 x Bananalogue Serge VCS modular slope generator (or similarly slope generator capable of generating exponential looping envelopes)
1 x Attenuator

Player 2:

1 x 3d Connexion Space Navigator with installed drivers and aka.spacenavigator object

Player 3:

1 x Shortwave Radio
1 x Cwejman VM-1 modular voice module
1 x Analogue Systems RS95 modular oscillator (or similarly specified device, optional)
1x Attenuator
1 x DPA 4061 omnidirectional condensor microphone with XLR connection

Max4Live devices:

NB. all Max4Live devices (shown in parentheses) referred to below must be loaded manually as per the following computer setup guide More information on the processes can be found in the Instrument and Device guides section of this document.

- Soundfile triggering (jr.rndpad)
- Complex Noise Generator (jr.noisegen)
- Feedback Noise Generator (jr.feedbacker)
- Soundfile scrubbing (jr.naviscratcher)
- Stutter effects (jr.autostutter)
- Granulation (jr.mdegranular)
- Clipping (jr.clipperfixed)
- Spectral gating / resynthesis (jr.thresher)
- Looping (jr.simplelooper)

Computer setup

To aid live performance a small number of analogue processes and sources have been modelled as software instruments using Max for Live. Some longer soundfiles are triggered alongside smaller performed fragments. The required soundfiles and Max for Live instruments can be downloaded from http://www.pixelmechanics.com/radiosilence, or copied from the attached DVD. The Max for Live instruments and effects should be installed into the indicated folders within the Ableton support directories. The defaults are ~/Library/Application Support/Ableton/Presets/Audio Effects/Max Audio Effect and ~/Library/Application Support/Ableton/Presets/instruments/Max Instrument.

Presets have been avoided, as far as is practical, in favour of a more flexible view of performer choice and action in creating and shaping sounds in real time, and in creating their own presets. If the modular electronics are not available, the work could be performed using the software only, but would result in a less engaging sonic palette for performers and audience.

All performers should start an Ableton session with clip quantisation set to none, and initial levels on instruments and channels appropriate to the first action for each performer. Midi controllers should be mapped to instrument and channel controls as the performer feels appropriate. In the case that the performer does not have enough midi controls, s/he should decide on which parameters to map and which control changes will be performed via the screen.

Performers should create the following:

Player 1:

1 x Stereo audio track - load all cue clips except 8, 15, and 25
1 x Stereo audio track - load only cue clips 8, 15, and 25
1 x Mono audio track - monitor analog electronics via external in 1
1 x Midi track - jr.noisegen
1 x Midi track - jr.rndpad, drop fragment soundbank into 'dropfolder', monitor midi in
1 x Return track - external out 3 & 4 to mixing board > prefader aux > external reverb or Ableton Reverb (Medium Room)
1 x Master out - external 1 & 2 to mixing board

Optional master channel effects for additional processing

Player 2:

1 x Midi track - jr.rndpad, drop fragment soundbank into 'dropfolder', monitor midi in
1 x Midi track - jr.naviscratcher, drop dusty soundbank into 'dropfolder'
1 x Return track - external out 3 & 4 to mixing board > prefader aux > external reverb or Ableton Reverb (Medium Room)
1 x Master out - external 1 & 2 to mixing board

Optional master channel effects for additional processing

Player 3:

1 x Mono audio track - monitor analog electronics via external in 1, 2 Ableton auto filters set to high pass and low pass filter in series
1 x Mono audio track - monitor shortwave radio via external in 2, 2 Ableton auto filters set to high pass and low pass filter in series
1 x Midi track - jr.noisegen
1 x Midi track - jr.feedbacker
1 x Midi track - jr.rndpad, drop fragment soundbank into 'dropfolder', monitor midi in
1 x Return track - external out 3 & 4 to mixing board > prefader aux > external reverb or Ableton Reverb (Medium Room)
1 x Master out - external 1 & 2 to mixing board

Optional master channel effects for additional processing

Analog electronic setup

It should be noted that due to the tolerances and general instability of analogue devices these settings are provided as a guide, and performers should use their preference in setting final positions.

Player 1:

RS95 oscillator:
Sine Output to Attenuator to External In 1

RS95 panel settings:
Range switch - wide
Frequency - almost 3 o'clock
CV Vary - 2v/Oct
Saw Shape - 12 o'clock

VCS slope generator:
Output to RS95 oscillator 1v/Oct input
AC Output to RS(% oscillator CV Vary input

VCS panel settings:
Cycle switch - cycle
Rise - 3 o'clock
Fall - fully CW
VC Rise & Fall - 12 o'clock, pushed in

Player 3:

VM-1 voice module:
Filter output to Attenuator to External In 1

RS95 oscillator (optional):
Saw/Triangle Ouput to VM-1 CV1
VM-1 panel settings:
COARSE frequency - just past 3 o'clock
FINE frequency 12 o'clock
PW - 8
WAVE SHAPE - pulse
PWM - 0
OSC / AUDIO MIX - 9
CV 1 - 0
CV2 - 0
CUTOFF - almost 900 Hz
Q-PEAK - midway between 7 and 8
MODE MORPH - LP
CM1 - 12 o'clock
OSC / AR switch - OSC
MIX switch - OFF
CM2 - 12 o'clock
Envelope controls are not used

Shortwave radio:
Shortwave radio is Mic'ed to External In 2

Score overview

The score contains information spread over two lanes per player. The top lane is the sounding lane, and provides a guide to players in respect of the type of sound they should be producing, and also offers a way for players to track the aprogress of their partners, by listening for certain sonic cues.

The second lane is the performer action lane, which contains dynamic and filtering instructions, cue information for player 1 (e.g. trigger a specific cue at a particular time), and also an indication of waveshape in the jr.naviscratcher instrument for player 2.

The sounding lane uses a graphic notation based on the Sonova font developed by Lasse Thoreson and Andreas Hedman (2007, 2007, 2010) for spectromorphological analysis of sound objects in Electroacoustic music, and is used with their kind help and permission. For more information on the Sonova font and its usage visit http://www.spectromusic.com.

Some modifications and additions (marked * in the following key, e.g. multiple rather than single spectral profile strata) to Thoreson and Hedman's approach have been made to suit performance, and a general overview of the symbols as they are used in this score is presented here, followed by more specific instruction at instrument and player level.

○ sine object / event (generally high frequency)

◇ sine-like object / event (some harmonics present through frequency modulation and/or waveshaping, generally high frequency)

◆ inharmonic object / event (Thoreson uses the term 'dystonic')

□ broadband percussive object / event

■ complex percussive object / event

● pitched object / event


broadband / white noise

\# shortwave radio *


dotted symbol indicates a micro-time event

solid horizontal line indicates sustained tone

dashed horizontal line indicates sustained impulses

angled solid line indicates variable sustained tone (generally short pitch or spectral movement within an object or event in this score)

highly variable pitch movement derived from varispeed processing *

An object's spectral profile, saturation and brightness is indicated by stratification on prolongation lines, or alternatively before the object in the case of single events of short duration.

low / mid complex * mid saturation sine-like saturated complex

Onset and ending types together with short dynamic/expressive fluctations and articulations are written as shown. If no marking is given, onset and ending are flat. Granularity and other features of microstructure, such as pitch and other deviations are also present.

brusque (aggresive) onset

marked onset

swelled onset

gradual onset

marked ending

swelled ending

soft ending

resonant ending

<> expressive cresc. / dim.

> expressive diminuendo

< expressive crescendo

dynamic deviation

slow, coarse granularity

mid, coarse granularity

mid, moderate granularity

pitch deviation

low / mid complex with granularity, swelled onset, fluctuations and soft ending

Objects can be combined into a composite that is played as an intial event followed by a secondary event. Composite objects may be stable or variable in respect of pitch and spectrum.

The speed at which the composite object is sounded is notated with either a 'ripple' time (c. 250 ms), 'flutter' time (c. 50ms, or simultaneously). If the composite object does not have an accompanying time symbol, the events should be separated by a short pause between events (c. 500ms).

pitched and inharmonic composite object, performed at ripple time

regular ripple

oblique (variably regular) ripple

regular flutter

oblique (variably regular) flutter

Objects can also be combined into a bracketed repeating rhythmic cell, and the notation for an ostinato has been adopted here to represent these morphologies. Thoreson and Hedman's scheme provides notation for bracketed content repetition. This is not used in this score, repetition is the rule for bracketed content and repetitions should generally be at variable speed. Shorter, gesture level accelerando and ritardando tendencies are also indicated where required.

ostinato with accelerando, ritardando and overall regular flutter speed

accel. rit.

Ostinato patterns, composite objects and single objects may be connected by a slur to show a complete gesture.

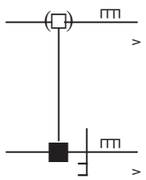
The final classes of events are accumulations (rapid clusters of events) and soundwebs (interwoven material comprising all other classes, played here as precomposed soundfiles).

soundweb with varispeed/pitch movement and spectral expansion/compression

iterative accumulations occuring at oblique ripple speed, with marked ending

The X axis of the score denotes time, the Y axis a general indication of target frequency and/or central bandwidth. Single events, composite objects and patterns are generally represented across the frequency axis as an indication of variance rather than a specific sounding instruction.

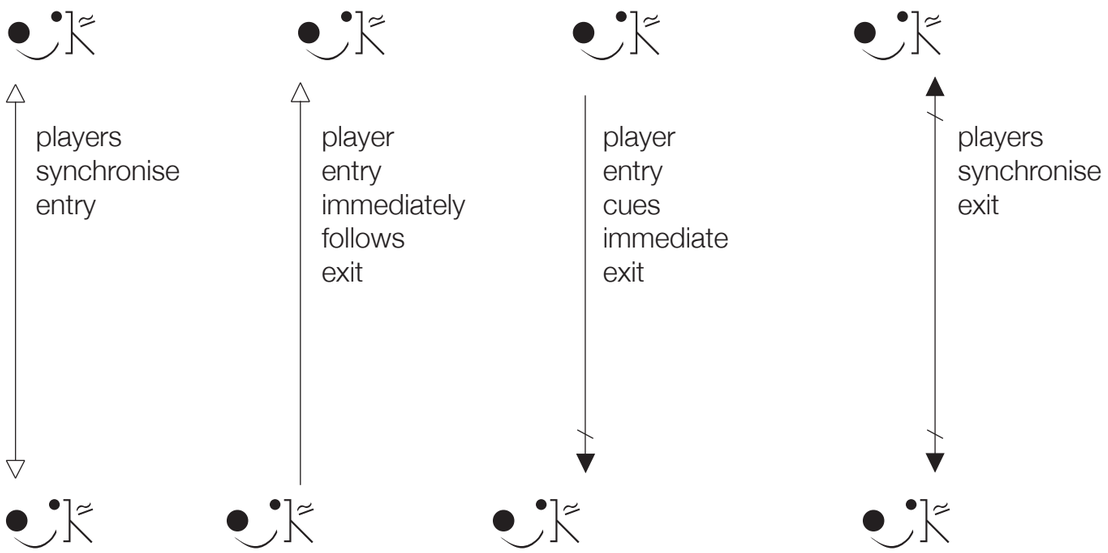
Object types can be connected with a vertical line indicating pitch and/or bandwidth stratification of a single object, with some spectral and morphological indications presented in parentheses. In this case, height on the frequency axis represents a central bandwidth for each component, regardless of other spectral markings on prolongation lines.



low / mid complex with coarse granularity and grainy broadband strata

Dynamic levels and hairpins are written into the performer action lane. Hairpins with no dynamic level indicated should be read as a move up or down one from the previously supplied instruction. Dynamic levels are fairly constant, but range from ppp to fff.

To aid rapid and accurate performance reading, player entry and exit is scored with a system of connecting arrows, deviating from Thoreson's approach to time-field notation (2010).

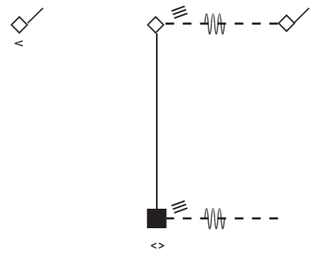


Score examples, instrument performance guides and special cases

Chirps (Player 1)

The opening chirps and modulated flutters (16s to 1'20) are produced by RS95 Oscillator and Serge VCS. By twisting the VCS Fall time through 3 o'clock to 2 o'clock and adjusting the Rise time through 3 o'clock to 12 o'clock a range of articulations from single chirp glissandi to flutters can be produced. A basic software model of this pair of modules is provided in the jr.chirps patch if the analogue electronics is not available.

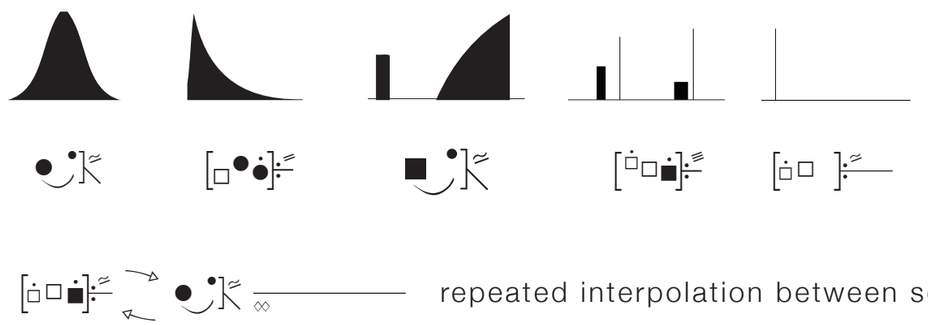
e.g:



Rhythmic clicks, pops & turntablist effects (Player 2)

The jr.naviscratcher instrument produces clicks and percussive events through to pitched material and turntablist effects by modulating sample playback via another buffer. The wave contained in the modulating buffer can interpolate from a gaussian bell curve (resulting in forwards-backwards sample playback) through to a single repeating click at the other extreme of the control dial. A folder containing sound files in dropped onto the buffer. When the instrument finishes one cycle of modulation another soundfile is chosen at random for the next cycle.

The ostinato and composite notations used offer a general representation of target sonic output. The examples below are a general guide to matching interpolating wave-shape to notation.



repeated interpolation between settings

The jr.naviscratcher instrument is primarily controlled by a 3d Connexion SpaceNavigator that provides up to six degrees of freedom. The mappings used in this work are:

Downwards pressure - amplitude,
Sideways left rotation - high pass filter cutoff frequency
Sideways right rotation - low pass filter cutoff frequency
Forwards / backwards roll - modulation frequency

Two other dial controls are provided for modulation interpolation, and attenuation of modulation frequency, which allows more of the original sound to be perceived.

The composite objects can be achieved by short movements and downwards pressure on the SpaceNavigator.

Variegated Noise (Player 1 & 3)

The Cwejman VM-1 is the main source of variegated, grainy noise and inharmonic tones in the guide recording, and the jr.noisegen instrument approximates some of its output.

The Cwejman VM-1 voice module is capable of extreme modulation of the filter by the oscillator, that creates a wide range of crackling, streaked and other types of variegated noise. It is possible to create some of these articulations with other modules (e.g. Analogue Systems RS95 oscillator and RS110 Multimode Filter) but without the precise control that the Cwejman unit offers, and for this reason no other ‘similar’ modules are listed in the technical specification.

Short bursts of noise can be created by moving CM1 CCW inducing modulation and the unit will cease to sound if CM1 and Q-PEAK are moved towards 12 o'clock. The Filter will continue to sound if Q-PEAK is turned to 0, and further high frequency components can be added by turning OSC / AUDIO MIX towards OSC.

Player 3 may choose between articulating events with the Cwejman or via the jr.noisegen patch. Player 1 should articulate variegated noise events with the patch jr.noisegen.

The variegated noise may include high frequency inharmonic (metallic and clustered) tones. The main component to jr.noisegen is pink noise feeding into a rapidly modulated state variable filter. There is a permanent low level hiss active which is only muted by master level or master mute controls.

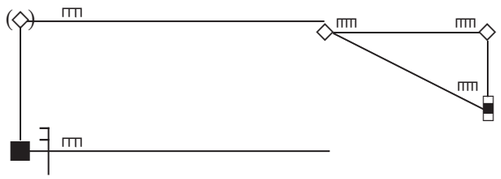
jr.noisegen provides the following controls for shaping its output.

Burst D	broadband noise with 3 different colours and amplitudes. Bypasses low pass filter.
Mute burst	mutes burst D output, and provides a character thump when activated
Clicks D	density of broadband click with variable amplitude, producing coarse, higher register fizzing texture. Bypasses low pass filter.
Clicks L	attenuator for broadband clicks
Mute clicks	mutes broadband click output
White L	adds a white noise component into main noise generator
Cycle L	adds a ringing component into main noise generator
Hipass	high pass filter post main noise output
LFO rate	frequency of low pass filter modulation post main noise output
LFO mod	amount of low pass filter modulation post main noise output
Lowpass	low pass filter post main noise output
Noise L	level of main noise output
Mute noise	mutes main noise output
Rmod L	ring modulation of post filter main noise output
Sine L	level of sine tone added to master output
Mute osc	mutes sine output
Oscil	variable control of rmod and sine frequency (selected via dropdown)
Clock	dropdown selection of source driving modulation of state variable filter.

Osc frq	frequency modulation source ranging from constant to bubbling sample and hold effects.
Filter type	selects filter type of main noise generator, providing access to a wider range of tones and gestures.
Unmute both	unmutes burst D, main noise and sine in a single click
Mute both	mutes burst D, main noise and sine in a single click

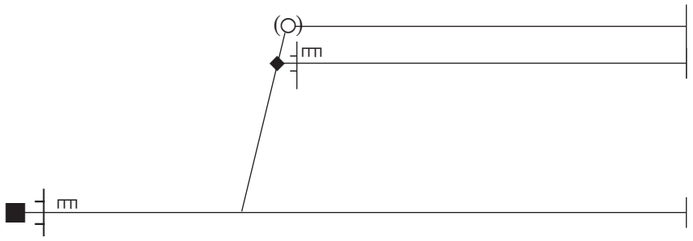
Selecting 'sah' in the clock source can cause desirable dropouts when coupled with 'lp' filter selection.

The 'const detune' oscillator selection causes a small pitch shift in the oscillator.



Unmute / mute both can be used to articulate gestures as shown.

By mixing and filtering the different components it is possible to realise the scored examples.



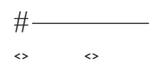
e.g. complex granular, saturated noise in the low register, widening to include inharmonic and sine partials.

Shortwave Radio (Player 3)

The radio should be switched to shortwave and tuned so as to be able to scan between a number of shortwave stations and static. The performer should aim to select a range of channels that contain spoken word and non-western music.

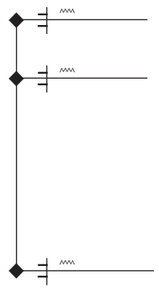
The radio is articulated using short gestures on the tuning control, with amplitude controlled by the radio's volume dial.

 composite gesture

 sustained event with short cresc./dim. played on tuning or volume control

Feedback (Player 3)

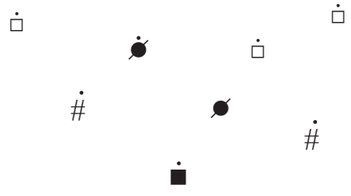
The feedback instrument, jr.feedbacker, is used at 2 points in the performance (5'31-48 & 11'35-45), and is scored as a chord of saturated, inharmonic noise.



The interpolation control provides for sweeping control of the feedback produced, which can also be played via the multislider. These gestures should be stopped dead via the mute control.

Sample fragments (all players)

Random sample fragments are triggered via midi pads, keyboard or laptop keys using the jr.rndpad instrument, which is velocity sensitive causing filtering and amplitude control in articulation.



These fragments are scored as isolated events, composite objects and agglomerations. It is not possible to predict which type of fragment will be produced, the notation is simply there to provide timing instructions and an indication of possible output.

In later sections (e.g. 9'45 - 11'00), the fragments should be played with and against the other players, perhaps focusing on syncopation, call and response, or antagonism!

Sample Cues (Player 1)

Sample cues are indicated in the performer action lanes, and the appropriate clip should be triggered as a one shot file (no warping, or looping)

The character of the resulting cue is included in the score as a guide for other performers.

Optional effects

jr.autostutter

A simple buffering and stuttering processor, with a single control for dry/wet balance of input signal and processed output.

jr.clipperfixed

A simple signal clipping device, with a with a single control for dry/wet balance of input signal and processed output.

jr.thresher

This device is a wrapper for the (FFTease) Thresher~ external. Thresher~ provides amplitude/frequency sensitive spectral gating and can provide output that ranges from spectral filtering through to sustained oscillation/resynthesis.

The device has controls for threshold, damping, processed level, and dry/wet balance of input signal and processed output.

jr.mdegranular

This device is a wrapper for the mdeGranular~ external. mdeGranular~ performs granulation of sampled sound in real-time. The device offers controls for grain duration, grain amplitude, granular density, potential grain start point in the sample buffer and potential grain end point in the smaple buffer. There are also buttons for stopping (livestop) and starting (livestart) signal input into the sampling buffer, which allows 'frozen' grain streams. There is a final control for dry/wet balance of input signal and processed output.

jr.simplelooper

This device provides a sustained loop of sampled input with variable speed and direction, and has controls for playback direction, sample triggering, and dry/wet balance of input signal and looped output.

Notes

Thoreson, L. and Hedman, A. (2007) *Spectromorphological analysis of sound objects: an adaptation of Pierre Schaeffer's typomorphology*, in Organised Sound 12(2): 129-141

Thoreson, L. and Hedman, A. (2009) *Sound-objects, Values and Characters in Åke Parmerud's Les objets obscurs, 3rd Section*, in Organised Sound 14(3): 310-320

Thoreson, L. and Hedman, A. (2010) *Form-Building Patterns and Metaphorical Meaning*, in Organised Sound 15(2): 82-95

The following MaxMSP externals and abstractions are included in this software distribution for convenience, with source and author(s) noted below:

aka.spacenavigator - http://www.iamas.ac.jp/~aka/max/
(Masayuki Akamatsu)

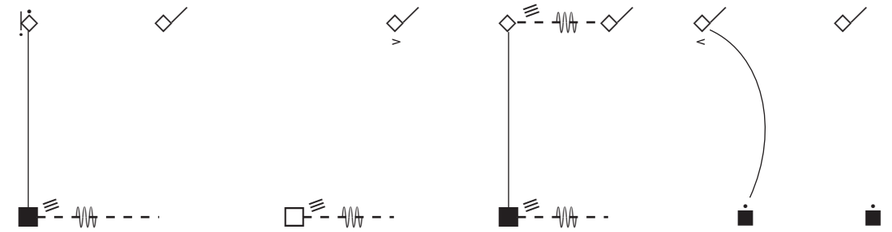
mdeGranular~ - http://www.michael-edwards.org/software/mdegranular/
(Michael Edwards)

Thresher~ - http://www.sarc.qub.ac.uk/~elyon/LyonSoftware/MaxMSP/FFTease/
(Eric Lyon, Christopher Penrose)

Performer Notes

0 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SECTION 1



PLAYER 1

ff *p* *f* *p* *f*

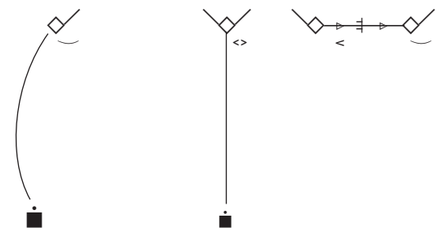
FREQUENCY

PLAYER 2

FREQUENCY

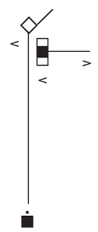
PLAYER 3

0 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

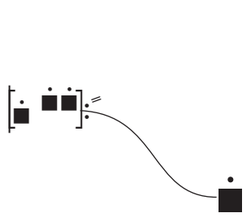


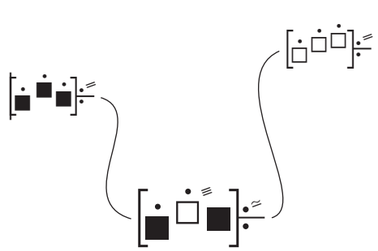
p

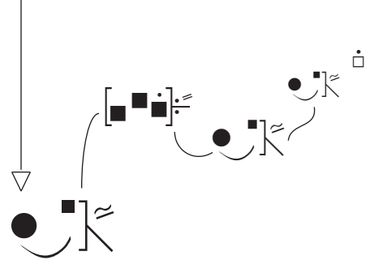
f

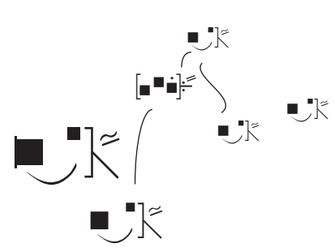


ff

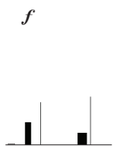






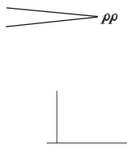


accel. rit.



f

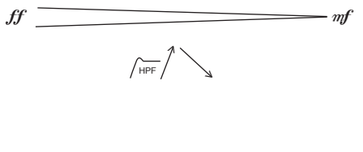
f



pp

ff *p*

HPF



ff *mf*

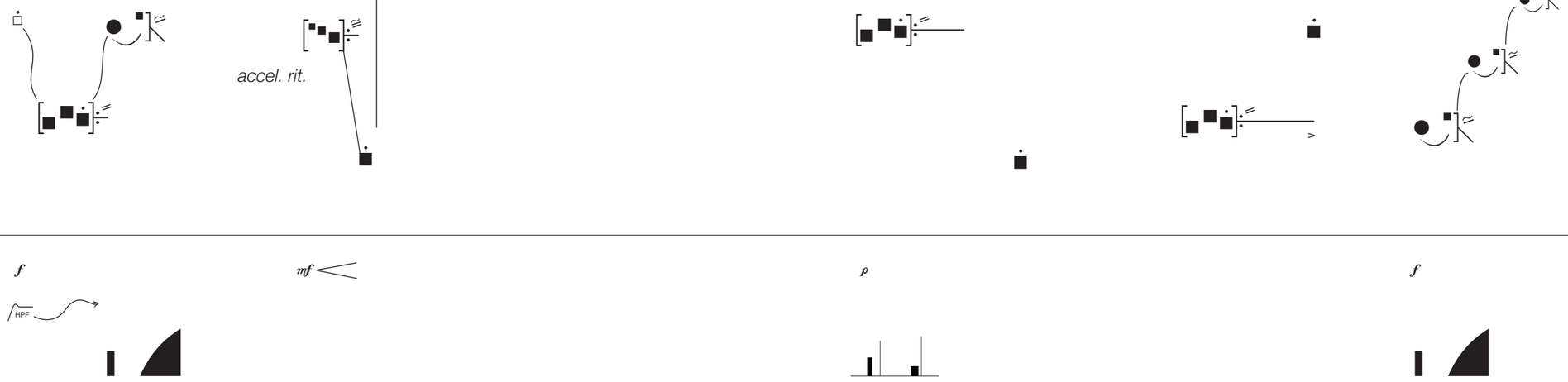
HPF

1 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

f

CUE 01

CUE 02



f *mf* *p* *f*

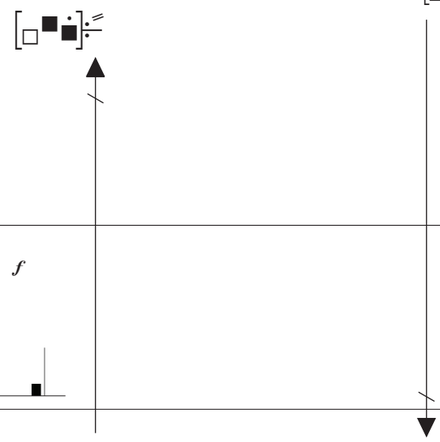
f

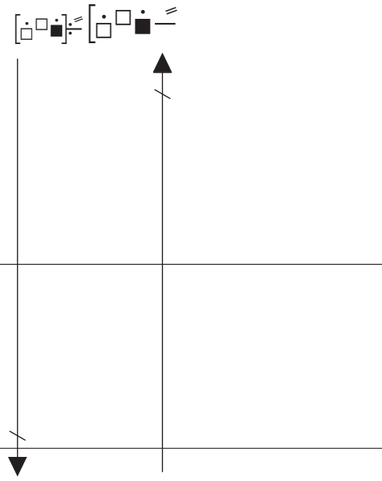
125

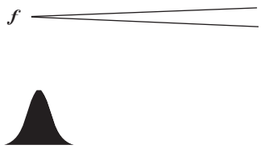
1 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

f

CUE 03

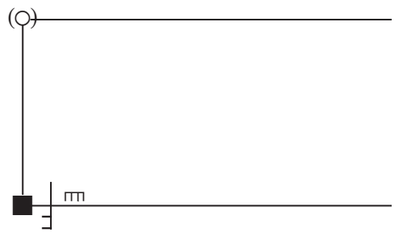


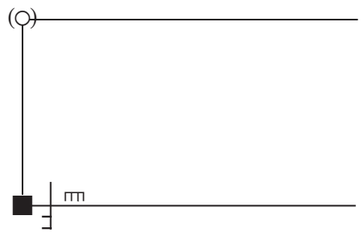


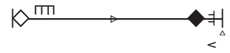


f

f



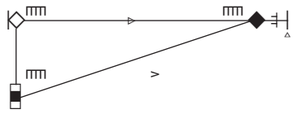




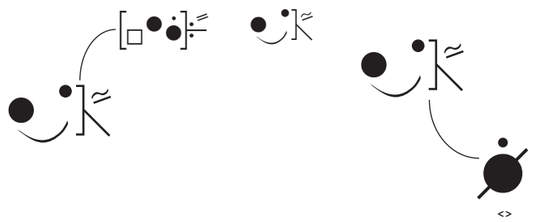
f

mf

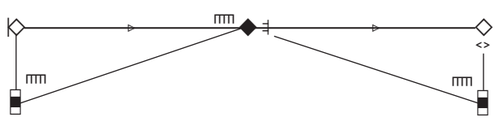
2 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

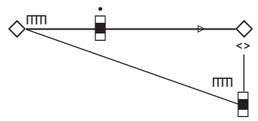


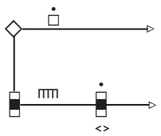
f



f





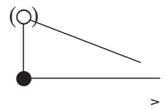


f

mf

f

2 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00



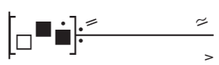
mp *f*

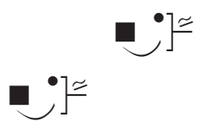
f *mp*

CUE 04

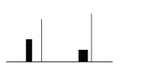
CUE 05

irregular phrasing

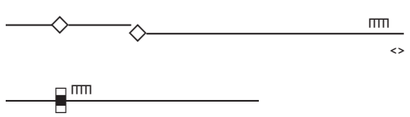


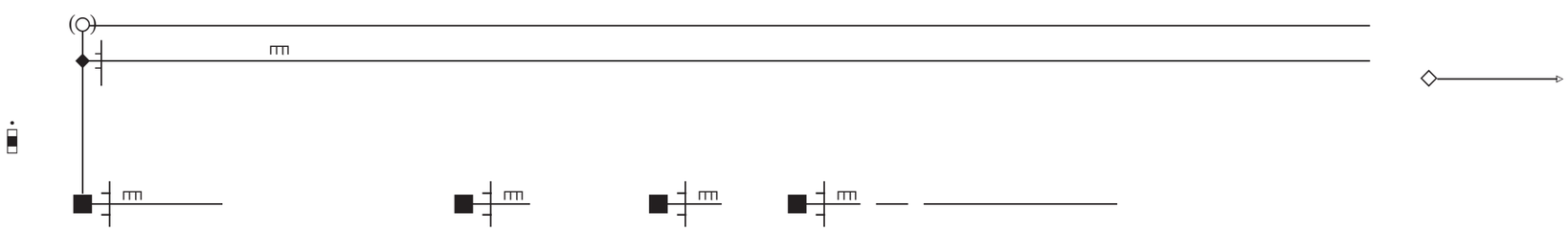


mf



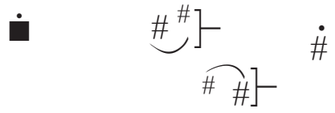
f





f

3 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30



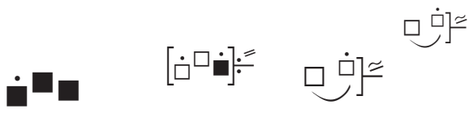
f

mf

mp

CUE 06

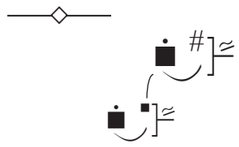
CUE 07



accel. rit.

p

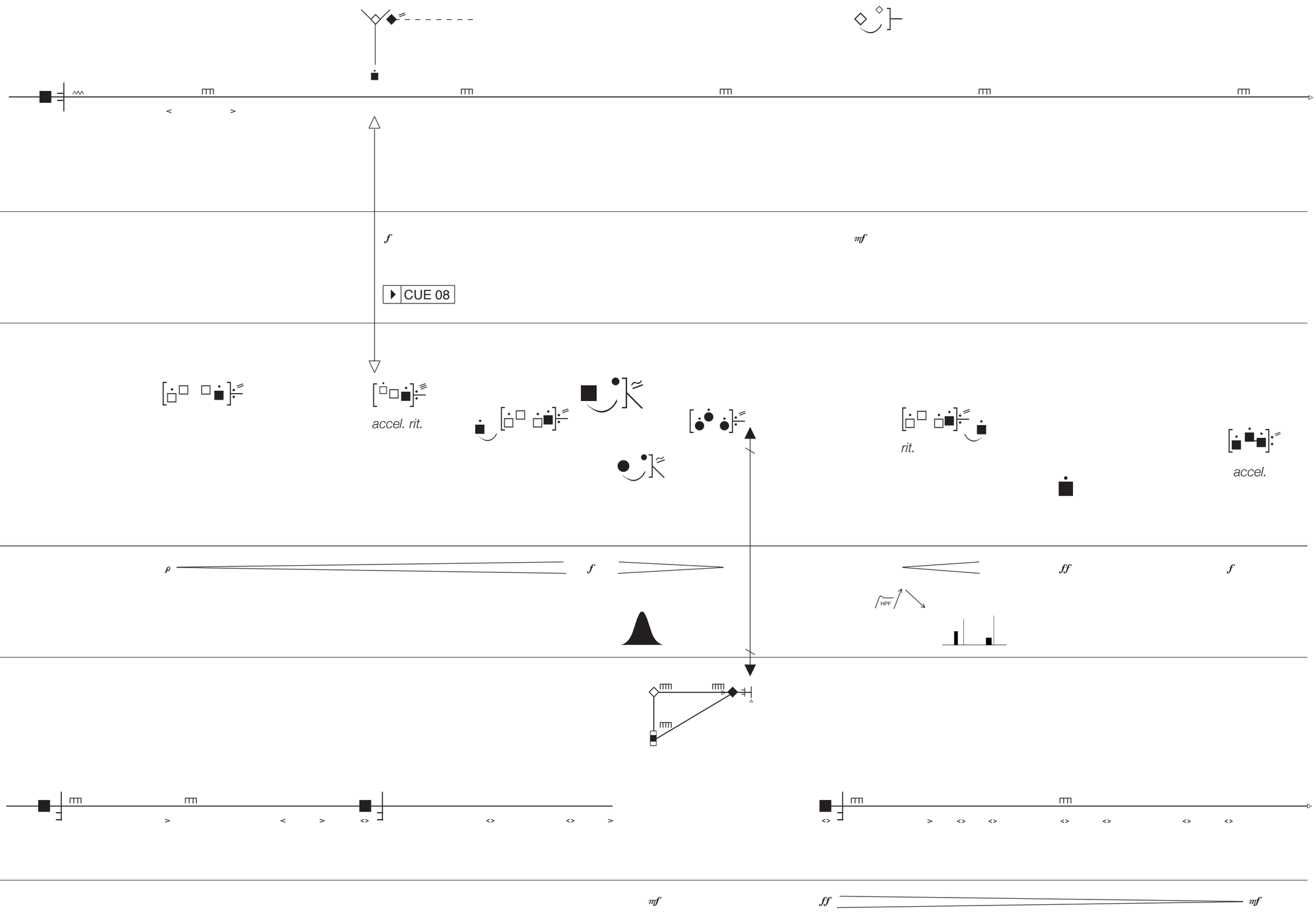
f



mp

mf

3 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00



4:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

mf

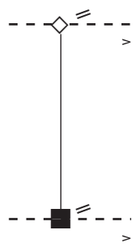
CUE 09

f

ff

mf

4 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00



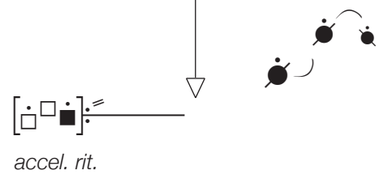
f

mf

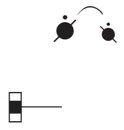
CUE 10

mf

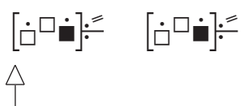
CUE 11



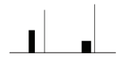
accel. rit.



accel. rit.

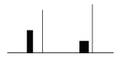


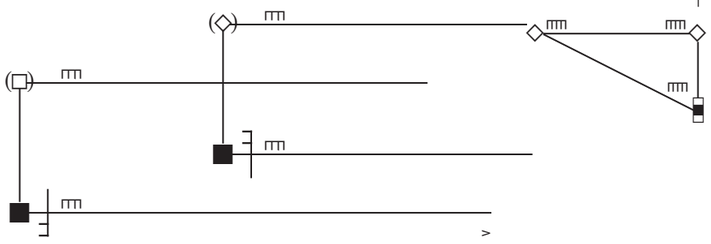
mf



mp

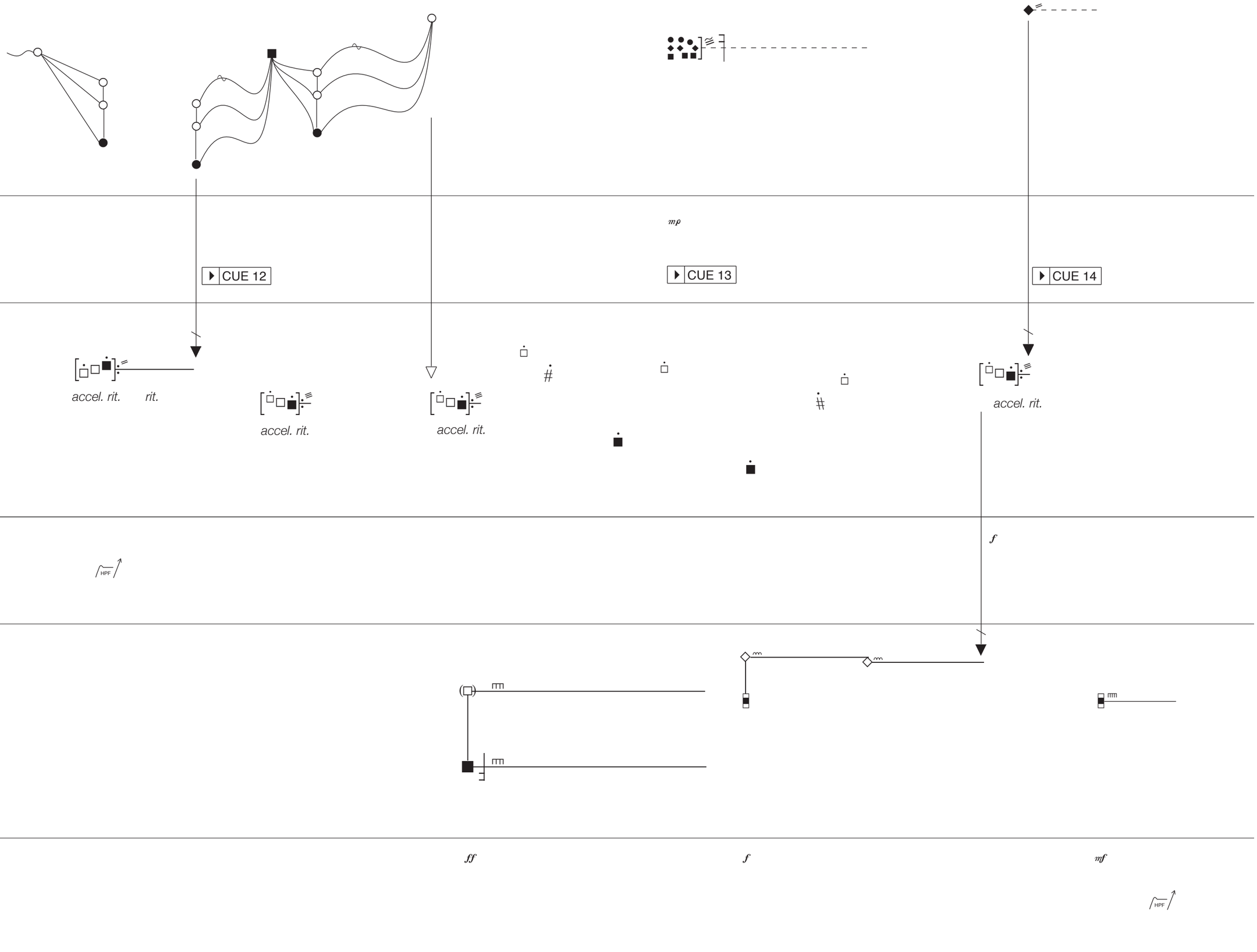
HPF



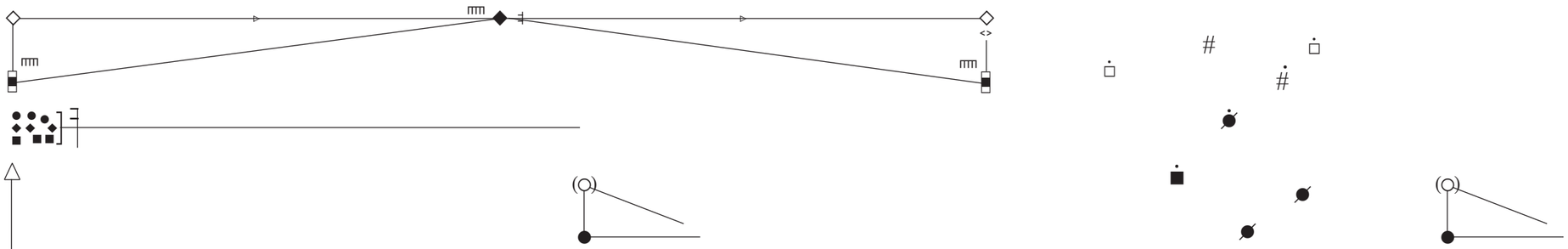


f

5 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30



5:30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00



f

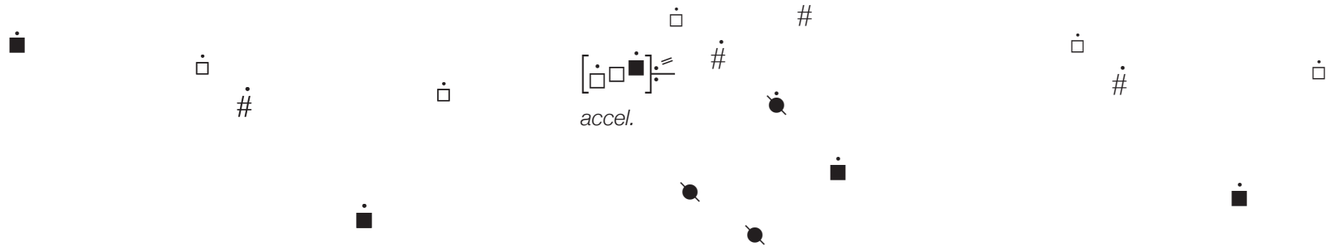
mf

mp

CUE 15

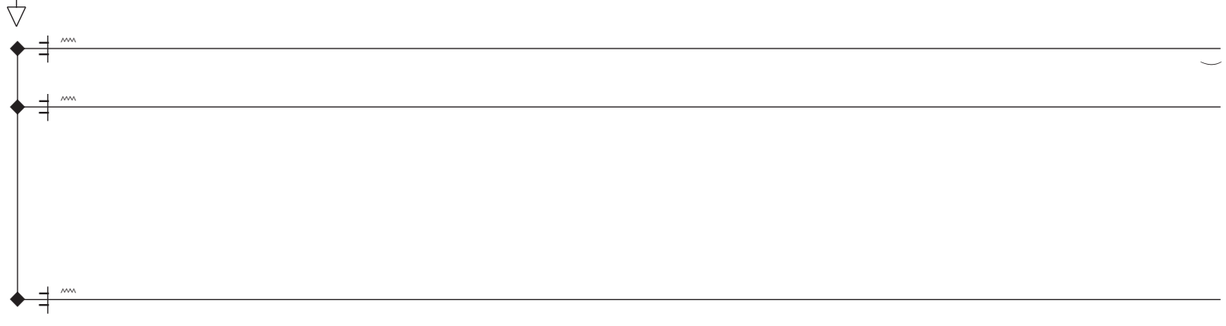
CUE 16

CUE 17



ff

mf

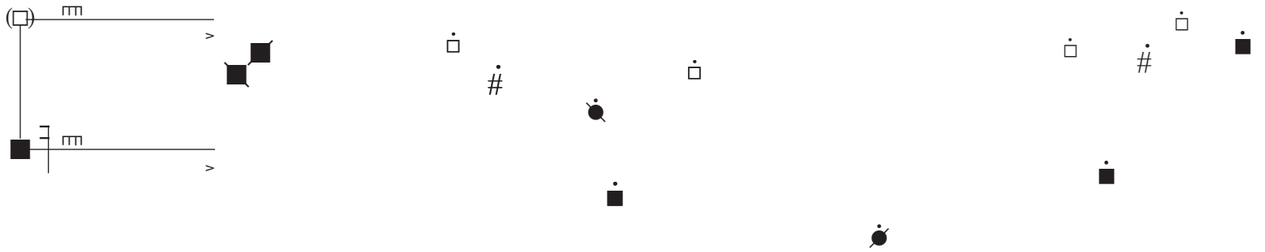


fff

mf

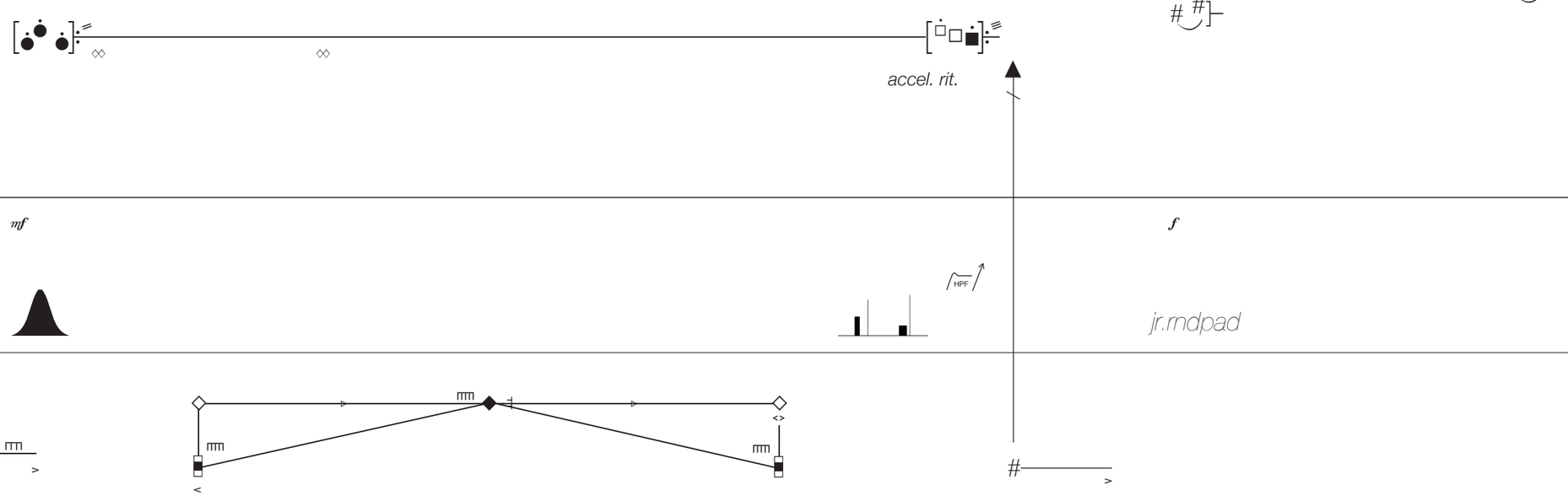
mp

6 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30



mp *ff* *mf*

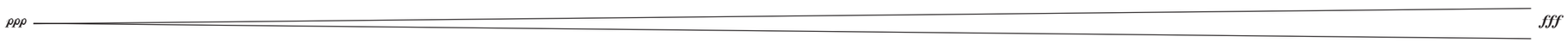
CUE 18



mf *f*

mp *mp* *ppp*

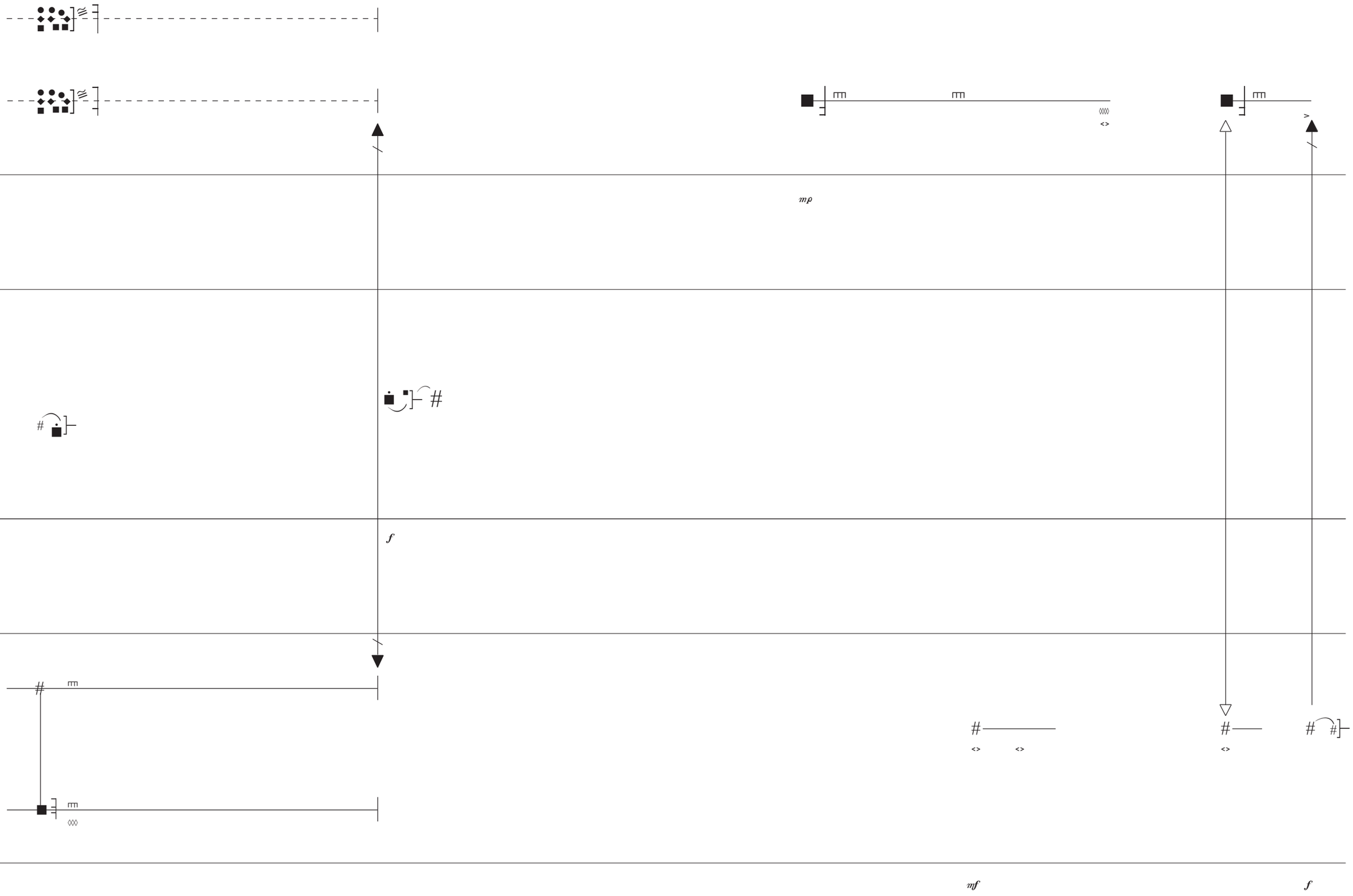
6 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00



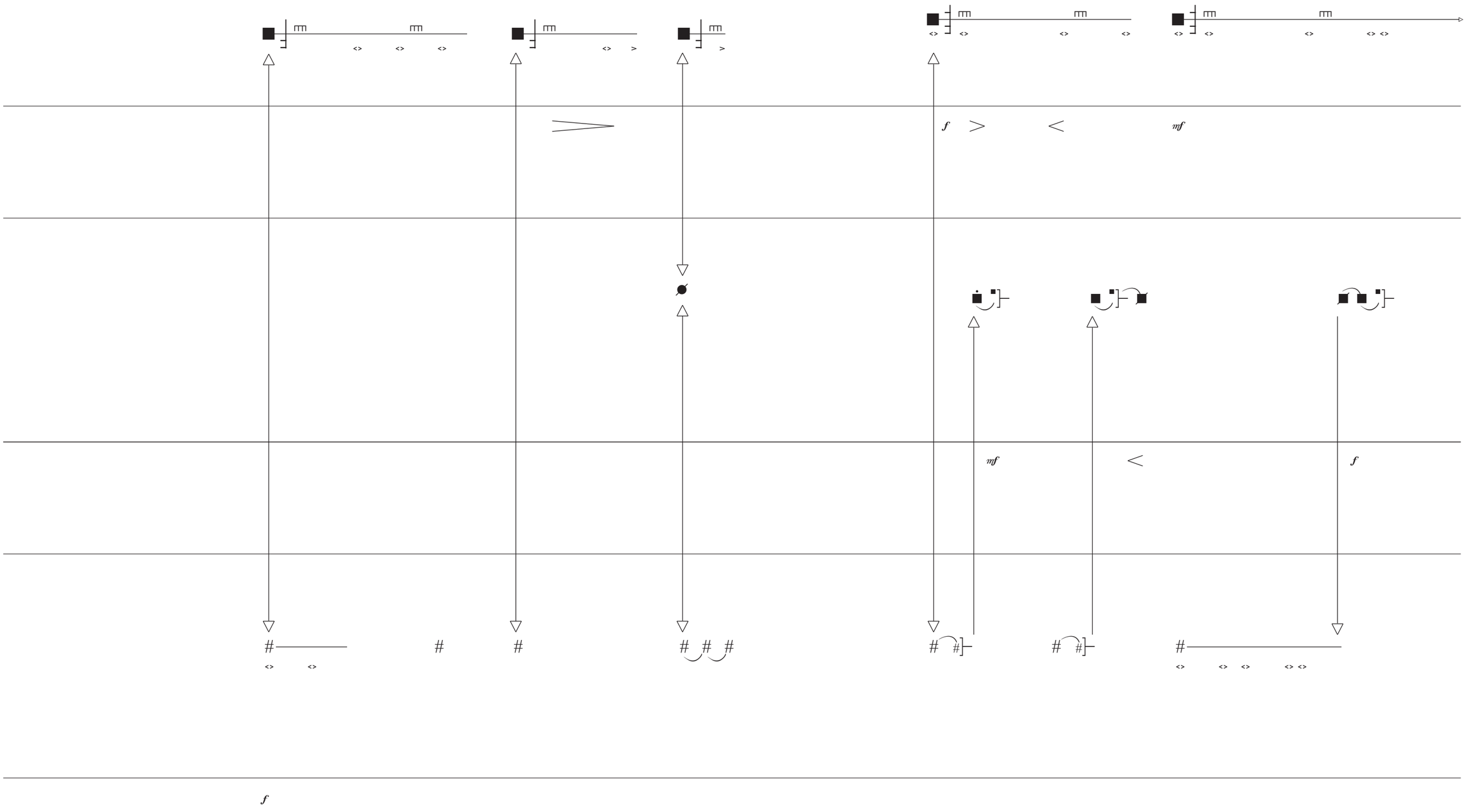
CUE 19

7:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

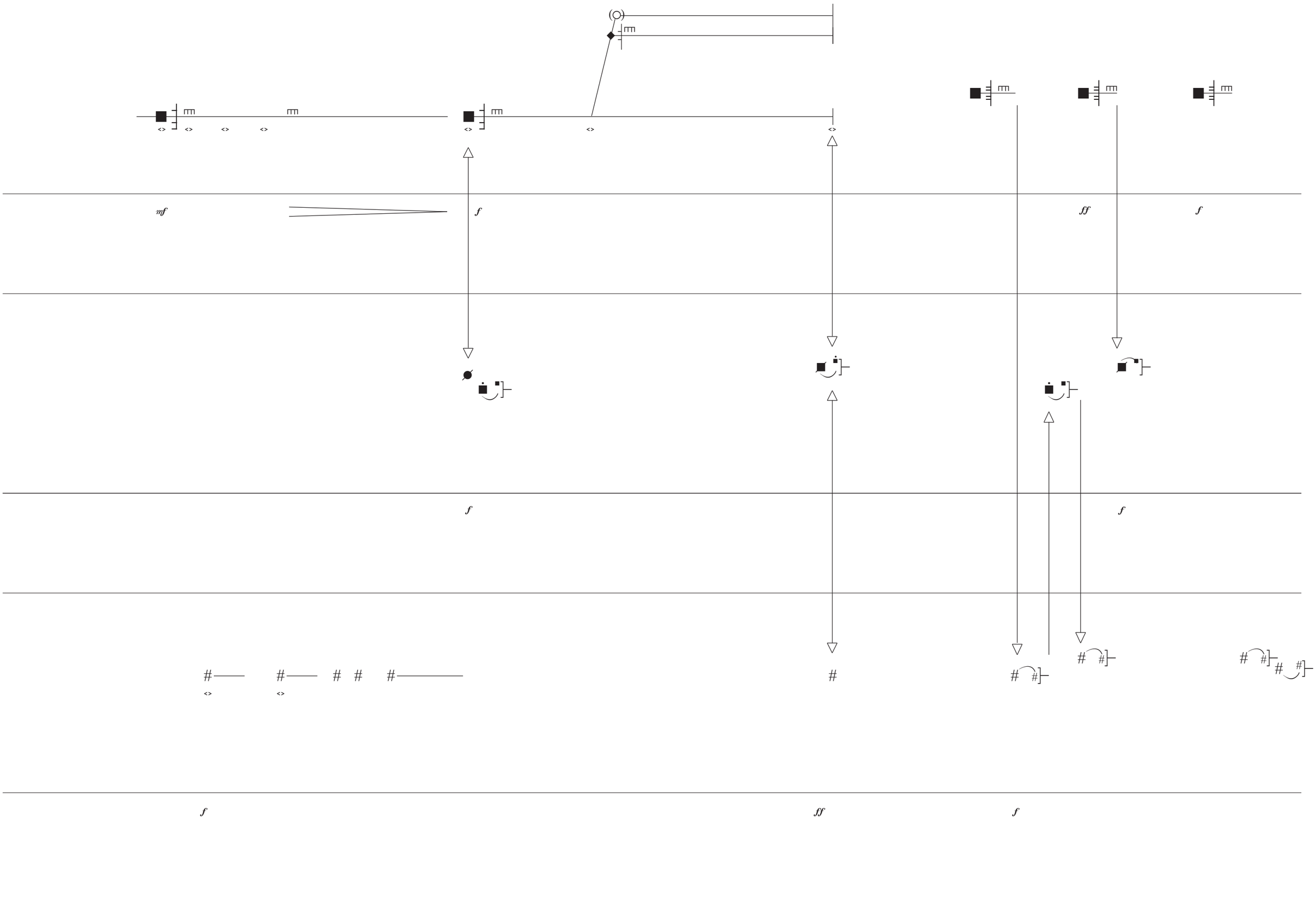
SECTION 2



7 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00



8:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30



8 :30 :31 :32 :33 :34 :35 :36 :37 :38 :39 :40 :41 :42 :43 :44 :45 :46 :47 :48 :49 :50 :51 :52 :53 :54 :55 :56 :57 :58 :59 :00

f

mf

accel.

mf

9 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

SECTION 3

f

CUE 20

CUE 21

f

f

mf

9:30 :45 10:00 :15 :30 :45 11:00

CUE 22

CUE 23

HPF

11:00 | | :15 | | :30 | | :45 | | :00

mf

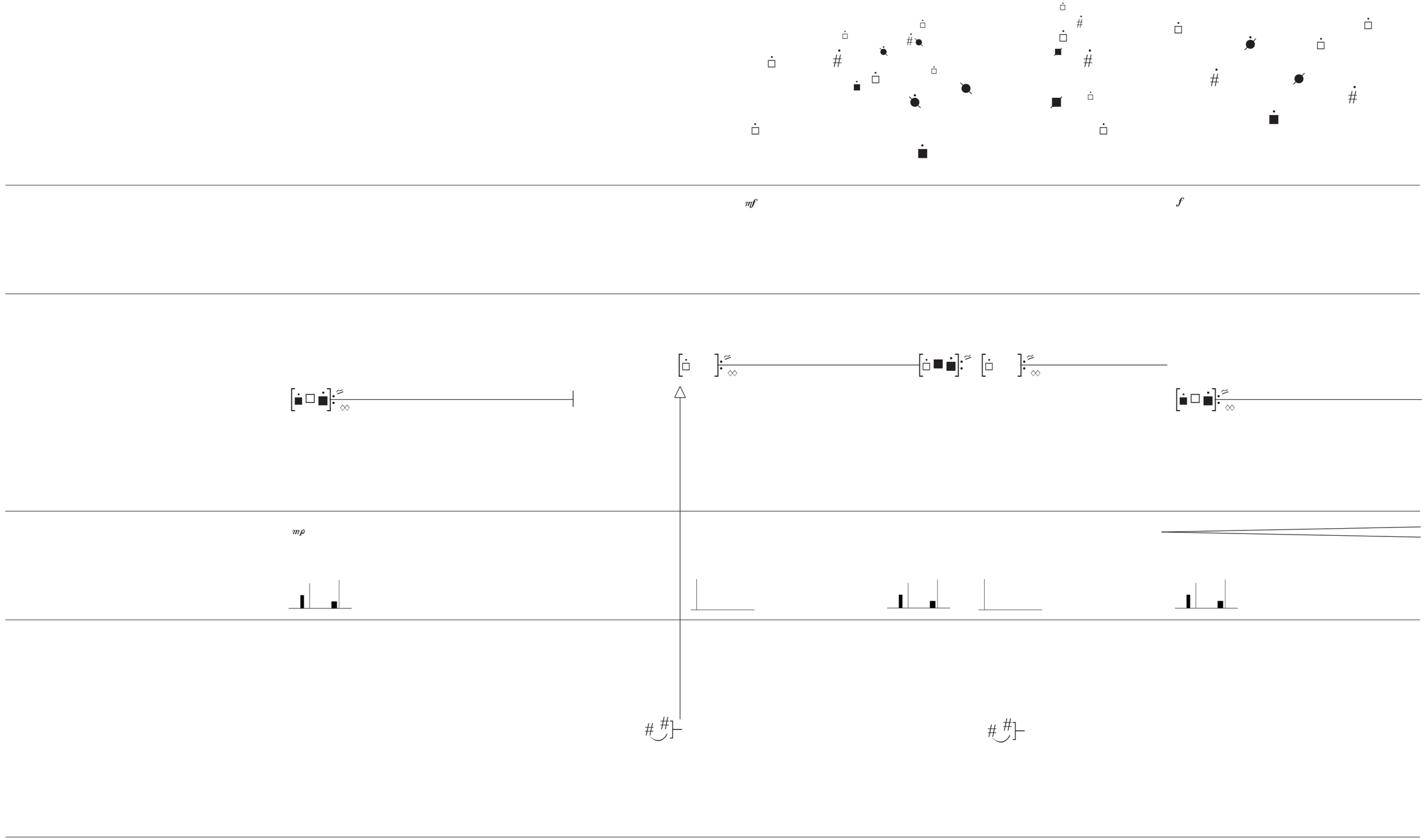
CUE 24

mp

ff

12:00 | | :15 | | :30 | | :45 | | :00

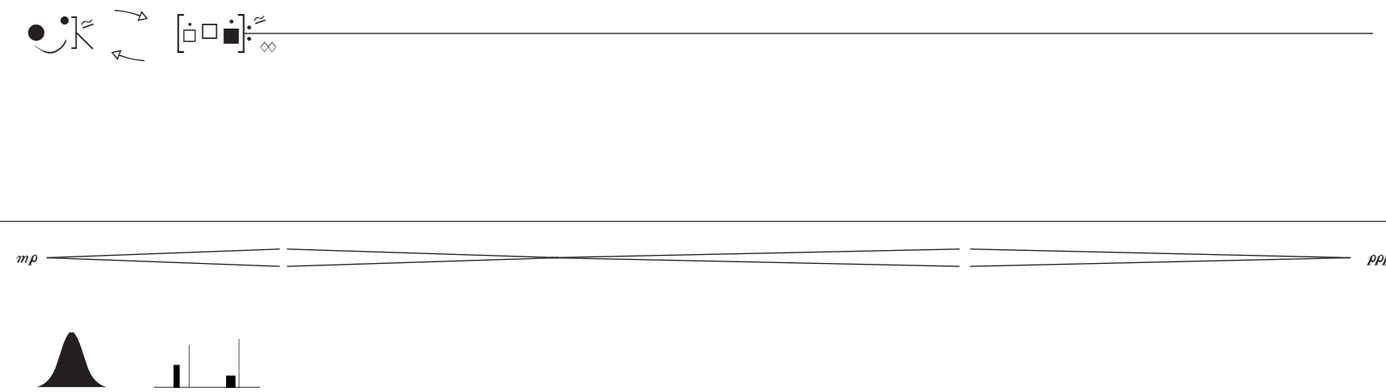
SECTION 4

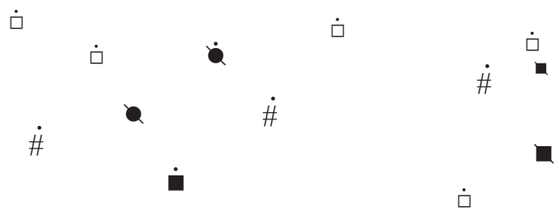


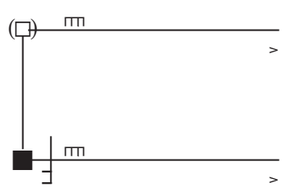
13:00 :15 :30 :45 :00

mf

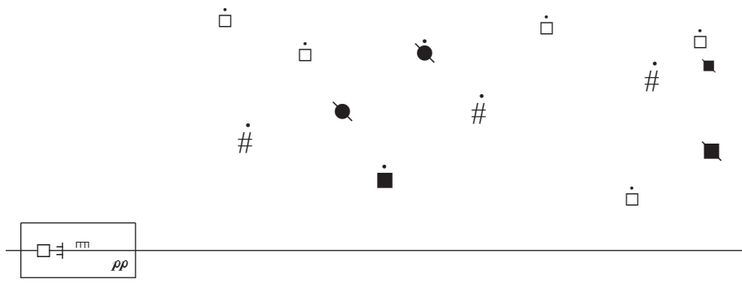
CUE 25

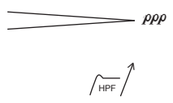


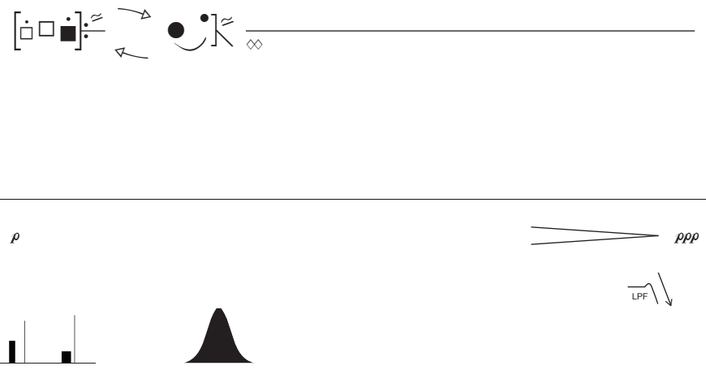




145 14:00 :15 :30 :45 :00



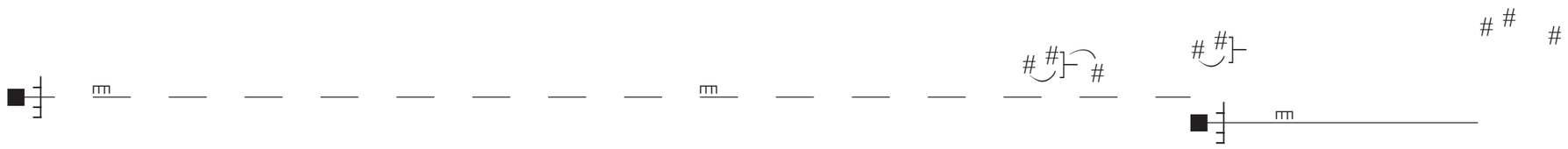




15:00 | :15 | :30 | :45 | :00

SECTION 5

CUE 26



147

16:00 :15 :30 :45 :00

mf *f* *ppp* *fff*

CUE 27

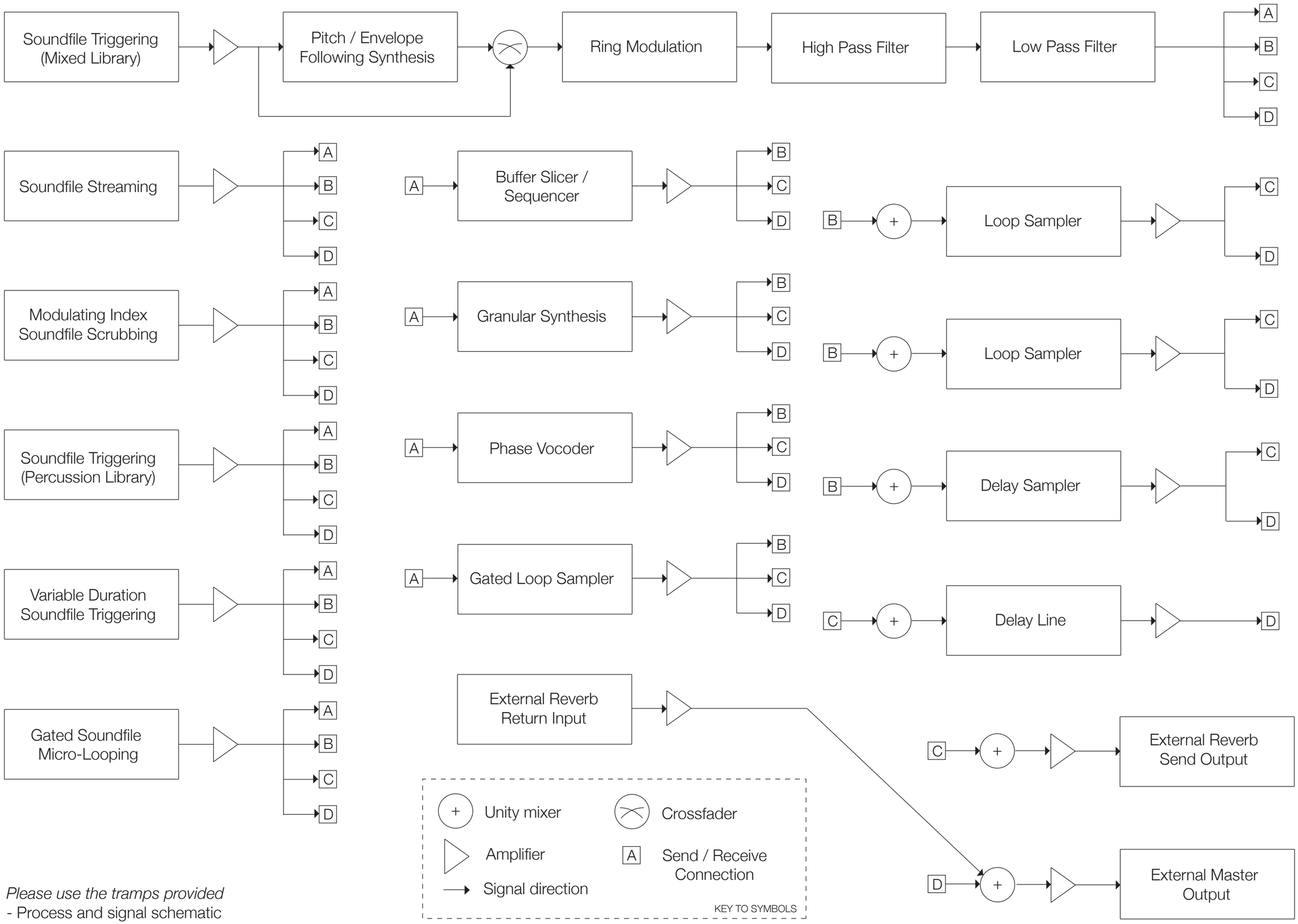
mf *fff*

ppp *f* *mp* *fff*

Please use the tramps provided

Solo performer, laptop, and controllers (c. 30'00)

Submitted in part satisfaction of the requirements for the degree of PhD in the University of Edinburgh, 2011



Please use the tramps provided
- Process and signal schematic

Performance note

Please use the tramps provided is a broadly programmatic work, with constituent parts that include field recordings made on London's Underground network, assorted chamber and percussion instruments, a prepared piano library, and a small number of voice-over recordings.

These materials are processed, layered, and edited in ways that resemble the creaks, squeaks, and squeals encountered on a Tube journey from North to South London, coupled with rapid and regular shifts of acceleration, ambience, and announcements.

In performance, a pre-mixed soundfile provides a foundation for improvisations and interjections that expand upon the character of the pre-composed material. The soundfile is available to download at http://www.pixelmechanics.com/tramps or to listen to on the attached CD.

When improvising, the performer should be guided by the fixed part, and create material that is similar to or complements the character of the fixed part as the piece unfolds. By playing with and against the underlying soundfile, the performer should reinforce and augment the structural and programmatic aspects of the work.

A graphics tablet, 3d controller and MIDI devices are used to trigger, freeze and scan through the contents of shorter sound files that are subject to further processing and manipulation, in a manner reminiscent of both early tape works and modern turntablism.

The performer needs to be aware of what may be approaching in order to preserve rapid shifts of direction. This is accomplished by careful listening to the pre-mixed soundfile prior to performance and also by referring to the following annotations that indicates important changes and events in the constituent elements of the pre-mixed part over time. RMS amplitude of the soundfile is shown above the annotations.

The final section (from 22’05) is more reflective and does not require significant processing other than light delay and looping effects. The vertical position of the components simply reflects the general layered construction of the work and is not an indication of either frequency or amplitude.

The performance begins when the performer triggers playback of the pre-mixed file. This file includes a number of silences (marked "cut" on the annotations, found at 4'24, 15'05, and 22'05) that would be suitable points for pausing playback of this soundfile. This allows the performer to extend the duration of the performance through improvisation appropriate to the situation before resuming playback of the fixed part.

For full performance flexibility a large number of controllers are required, with generally one knob per function in the software environment, although a performance could be made with a more minimal setup.

Technical setup and signal processes

1 x 2 channel, full frequency PA system
1 x Small format mixing board (Mackie 1202 or similar, minimum 4 input channels, 2 aux sends/returns, and 2 outputs)
1 x High quality stereo reverb (Lexicon, TC Electronics or similar)
1 x Apple MacBook Pro Intel 2GHz or better running Cycling '74 MaxMSP 5
1 x High quality multichannel audio interface (RME Fireface, Metric Halo or similar, minimum 4 output channels)
1 x Wacom Intuos3 A6 wide graphics tablet
1 x 3d Connexion SpaceNavigator with installed drivers
1 x MIDI key controller offering 8 potentiometers (M-Audio Oxygen 8 or similar)
1 x MIDI pad controller offering 8 pads (Korg Nanopad preferred)
1 x (or more) MIDI controller(s) providing 32 faders / potentiometers (2 x Faderfox LV1 preferred)

NB. all processes and subpatchers (shown in parentheses) referred to below are contained in the main _jr.tramps.maxpat MaxMSP file. More information on the processes can be found in the Instrument and Device guides section of this document.

1 x Soundfile triggering (jr.5.wacombuf) Polyphonic soundfile triggering with optional control of playback direction and attenuated random pitch/speed offset
1 x High pass filter (jr.5.simplesvf) 12dB/octave high pass filter
1 x Low pass filter (jr.5.simplesvf) 12dB/octave low pass filter
1 x Soundfile streaming (jr.5.qplay) Direct-from-disk soundfile streaming
1 x Soundfile scrubbing (jr.5.scratcher) Monophonic soundfile scrubbing with interpolating buffer index modulation and variable modulation rate
1 x Soundfile triggering (jr.5.polynanocracker) Polyphonic soundfile triggering
1 x Variable duration soundfile triggering (jr.5.wacomtrigger) Polyphonic soundfile triggering with control of playback direction, and variable start point and decay
1 x Gated soundfile micro-looping (jr.5.stutterbuf) Monophonic soundfile micro-looping with gated output and variable start point and loop length
1 x Buffer slicer / sequencer (jr.5.slicer) Monophonic sampling loop slicer/sequencer
1 x Granular synthesis (jr.5.grn.patcher) Live or sampled buffer granulation with gated output and variable index, grain envelope and grain length
1 x Phase Vocoder (jr.5.pvoc) Monophonic sampling phase vocoder with gated output and variable buffer index
1 x Gated loop sampler (jr.5.gesture) Monophonic samping looper with gated output and variable playback speed and direction
2 x Loop sampler (jr.5.ezlooper) Looper with variable playback speed and direction
1 x Delay sampler (jr.5.autosample) Polyphonic variable probability sampling delay
1 x Delay line (jr.5.dub) Variable delay time delay line with feedback and filter stage

Computer setup

The MaxMSP patches, externals and soundfiles required to perform the work can be downloaded from http://www.pixelmechanics.com/tramps, or copied from the attached DVD. The directory structure should be left intact after extraction and the root directory should be added to the MaxMSP search path with Subfolders option checked. (NB. to avoid external and abstraction conflicts only one root folder from Jules Rawlinson's works should be added to the MaxMSP search path at a time.) The _jr.tramps.maxpat MaxMSP file hosts all the instruments and processors used to perform the work as bpatchers (modular devices with GUI).

Two sets of stereo outputs are provided in the patch, one for the main output, and another which can be configured as a pre-fader send to the external reverb unit (set to a Plate type reverb). This configuration provides an easy way to generate a wet/dry balance in performance. Reverberation is left to the performer's discretion, but should add a moderate ambience to audio output.

Performance patch overview

The performance patch _jr.tramps.maxpat has been been designed to automatically load a controller mapping preset and all soundfiles into the appropriate instruments. Soundbank folders can also be dropped into instruments if necessary.

MIDI and key mappings can be re-configured and saved as required for the performers individual setup using drop-down boxes and assignment abstraction on individual bpatchers (modular devices with GUI) and sub-patcher "sends.controls". Where MIDI preset mapping is not available, MIDI note and controller numbers are indicated as these can often be configured on the MIDI device. Instructions for mapping and saving MIDI and keystroke information can be found in the subpatcher "sends.controls" in _jr.tramps.maxpat.

A number of sample triggering and sampling instruments and effects are provided that can be mixed and processed as appropriate to the character of the performance. These devices are equipped with inputs for mapping parameters to MIDI controllers and some offer additional on-screen controls.

The Wacom graphics tablet bpatcher devices are equipped with a toggle to turn on/off controller data coming from the device in the device GUI. As multiple devices can be active, interesting layers of sound can be achieved with the performer's focus and intention shifting between instruments. The template for jr.5.wacombuf is shown below.

REFERENCE GUIDES SCALED TO SUIT WACOM INTUOS3 A6 WIDE, ENSURE PRINTER IS SET TO PRINT 100%

PLEASE USE THE TRAMPS PROVIDED

TOP LEFT EDGE WACOM SURFACE > | PREP. PIANO | PERC. | VIOLIN | CELLO | TMPT | TURNTABLISM

Sample triggering instruments

jr.5.qplay

This device streams playback of a single soundfile from disk, and for this work is responsible for playback of the (preloaded) pre-mixed part. The device includes an elapsed time display, and an input for jumping to a specific minute in the file.

On-screen transport controls are provided for loading, playing (and resuming), pausing, and resetting the soundfile. Amplitude controls are also present in the device. The bpatcher is equipped with inputs for mapping keystrokes to transport controls, and for mapping a controller to amplitude. Output from this device is sent to the main output, looping instruments, and delay effects.

jr.5.wacombuf

This instrument is played with the Wacom graphics tablet and triggers short soundfiles, which can be post-processed via a crossfading pitch follower, ring modulation and high and low pass filtering. Soundfiles are mapped onto the X axis, and soundfile amplitude is mapped onto the Y axis. Reverse playback can be triggered by holding down the tip switch.

Overall amplitude control sits between the instrument and post-processing and a control input is provided for attenuating randomised re-pitching of the sample. Output from this instrument is sent to the main output, looping and resampling instruments, and delay effects.

The order of soundbank types for this performance runs left-to-right:
prepared piano, percussion, violin, cello, trumpet, turntablist fragments

jr.5.wacomtrigger

This instrument is played with the Wacom graphics tablet and triggers polyphonic fragments of a single soundfile. The fragment start-point is mapped to the X axis and fragment amplitude is mapped to the Y axis. Overall amplitude control is situated in an external gain control bpatcher (jr.5.gainmetersml~), and a control input is provided for fragment length. Output from this instrument is sent to the main output, looping instruments and delay effects.

jr.5.scratcher

This instrument is played with a 3d Connexion SpaceNavigator, and produces clicks and percussive events through to pitched material and turntablist effects by modulating sample playback via another buffer. The wave contained in the modulating buffer can interpolate from a Gaussian bell curve (resulting in forwards-backwards sample playback) through to a single repeating click at the other extreme of the control. When the instrument finishes one cycle of modulation another soundfile is chosen at random for the next cycle.

The SpaceNavigator offers up to six degrees of freedom, allowing multiple controls to be mapped to a single device.

The mappings used are:
Downward pressure - amplitude,
Sideways left rotation - high pass filter cutoff frequency
Sideways right rotation - low pass filter cutoff frequency
Forwards / backwards roll - modulation frequency

Two other control inputs are provided for modulation interpolation, and attenuation of modulation frequency, which allows more of the original sound to be perceived.

Overall amplitude control is situated in an external gain control bpatcher (jr.5.gainmetersml~). Output from this instrument is sent to the main output, looping instruments, and delay effects.

jr.5.polynanocracker

This instrument responds to velocity information and is played with a MIDI pad controller mapped to notes 61,62,63,64 on the top row and notes 67 68 69 70 on the bottom row.

The order of soundbank types for this performance runs left-to-right:
Top row: prepared piano, prepared piano, mixed percussion, cymbals
Bottom row: gongs, toms, snares, ride cymbals

Soundfile amplitude is controlled by velocity and overall amplitude control is situated in an external gain control bpatcher (jr.5.gainmetersml~). Output from this instrument is sent to the main output, looping instruments, and delay effects.

jr.5.stutterbuf

This instrument is played with the Wacom graphics tablet and triggers micro-looping fragments from a single soundfile. The loop length is mapped to the X axis, loop start-point is mapped to the Y axis and loop amplitude is mapped to the Z axis (pressure).

Overall amplitude control is situated in an external gain control bpatcher (jr.5.gainmetersml~). Output from this instrument is sent to the main output, looping instruments, and delay effects.

Sampling and looping instruments

jr.5.slicer

This instrument is played with the Wacom graphics tablet, or with onscreen multisliders, and provides slicing and sequencing of sampled input, generating glitch effects and stuttering loops.

Control inputs are provided for sequence rate, sequence activity, recording trigger, and overall output level. Output from this instrument is sent to the main output, looping instruments, and delay effects.

jr.5.pvocpatcher

This instrument is played with the Wacom graphics tablet and provides FFT resynthesis of sampled input. Buffer position is mapped to the X axis and amplitude is mapped to the Y axis. Control inputs are provided for recording trigger and overall output level.

If the graphics tablet is toggled-off while the stylus is still touching the tablet a sustain can be effected. Output from this instrument is sent to the main output, looping instruments, and delay effects.

jr.5.grn.patcher

This instrument is played with the Wacom graphics tablet and MIDI key controller and provides granulation of sampled input, and can generate synchronous and asynchronous grains. Grain start point (in the buffer) is mapped to the X axis and grain amplitude is mapped to the Y axis.

Output from this instrument is sent to the main output, looping instruments, and delay effects.

A control input is provided for recording trigger (plus controller 25), loop recording (live granulation, controller 24), and MIDI and on-screen controls for grain speed (controller 91), grain speed jitter (93) , grain position jitter (71), grain duration (74), grain duration jitter (84), grain pitch jitter (1), grain amplitude (7), and high (5) and low (10) pass filter cutoff.

Grain window types are Hanning (controller 20, val 127), Exponential Attack (21), and Exponential Decay (22).

jr.5.gesture

This instrument is played with the Wacom graphics tablet and provides gated looping of sampled input with variable speed and direction. Speed and direction are mapped to the X axis (-2 to 2 times original playback rate at the tablet extremes) and amplitude is mapped to the Y axis. Control inputs are provided for recording trigger and overall output level.

A sustained loop can be achieved by toggling-off this device on the MaxMSP interface while the stylus is still touching the tablet. Output from this instrument is sent to the main output, looping instruments, and delay effects.

jr.5.ezlooper

This instrument is played with a midi controller and provides a sustained loop of sampled input with variable speed and direction. Control inputs are provided for speed / direction (-1 to 1 times original playback rate at the tablet extremes), recording trigger and overall output level.

The composer's preference is for speed and direction to be mapped to a high quality midi-enabled crossfader such as those found on Faderfox controllers, affording rapid and precise changes in speed and direction that produce effects similar to turntablism.

Controllers allowing, 2 of these devices are present, offering opportunities for layered looping. Output from this instrument is sent to the main output, and dub delay.

Delay effects

jr.5.dub

This effect provides tape delay simulation, with feedback and low pass filtering stages. Control inputs are provided for delay time, feedback amount, filter cutoff, input level and output level. Output from this effect is sent to the main output.

jr.5.autosample

This effect provides polyphonic variable pitch and direction delays. A control input is provided for a random activity threshold. When the control is at its maximum level the effect is not active. As the threshold level is increased the device is more likely to sample incoming audio into an an available voice for delayed playback.

Output from this instrument is sent to the main output, and dub delay effect.

Notes

The software distribution includes a granular sequencer (jr_graintest.maxpat) that was used to create the granular textures in this work.

This work makes use of the following Freesound Project samples with Creative Commons Sampling Plus 1.0 Licence

http://www.freesound.org/samplesViewSingle.php?id=47239
http://www.freesound.org/samplesViewSingle.php?id=60290
http://www.freesound.org/samplesViewSingle.php?id=60293
http://www.freesound.org/samplesViewSingle.php?id=61142

http://www.emmaclarke.com/media/7128/do-not-drop-litter-on-the-train.mp3 is used with the kind permission of Emma Clarke (http://www.emmaclarke.com)

The prepared piano soundbank is a licensed subset of Big Fish Audio John Cage Prepared Piano and should be used solely to perform the work.
http://www.bigfishaudio.com/detail.html?325

The following MaxMSP externals and abstractions are included in this software distribution for convenience, with source and author(s) noted below:

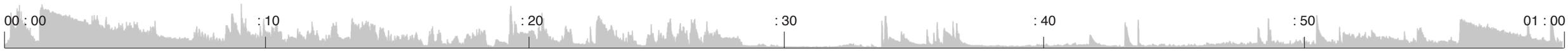
aka.spacenavigator - http://www.iamas.ac.jp/~aka/max/
(Masayuki Akamatsu)

mp.assignment - http://www.tinpark.com/category/research/software/
(Martin Parker)

mp.grainwindow~ - http://sd.caad.ed.ac.uk/maxhelp/2010/11/mp-grainwindow/
(Martin Parker)

wacom - http://cnmat.berkeley.edu/downloads
(Jean-Michel Couturier, Richard Dudas, and Michael Zbyszynski)

Performer Notes



DENSE TRUMPET RIFFING
BUSY PERCUSSION
SPARSE STRINGS, PIANO & SCRATCH FX

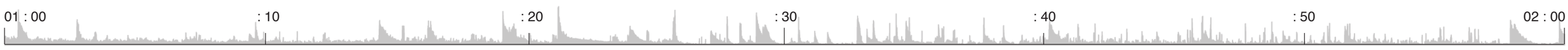
FINAL TRUMPET

ANN. “MIND THE DOORS”

SPARSE PERC. & PIANO

REGULAR BLOWNOISE

TRAIN PULLS AWAY



ANN. “NEXT STATION IS LEICESTER SQUARE”

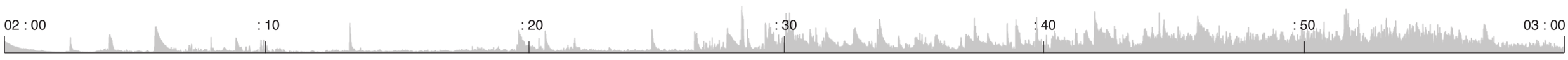
SPARSE PERC. & SCRATCH FX

ANN. “THIS STATION IS LEICESTER SQUARE”

ANN. “THIS TRAIN IS FULL & READY TO DEPART”

VOX GRAINS

VOX GRAINS



TURNTABLIST VOX

VERY SPARSE PERCUSSION

LOW LEVEL FLUTTERS

SPARSE PERCUSSION

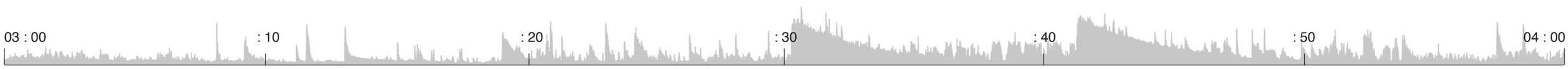
BUSY PERC. & PIANO FLURRIES

TRAIN PULLS AWAY

SPARSE PERC. & PIANO

TRAIN NOISE

ANN. “THE NEXT STATION IS CHARING CROSS”



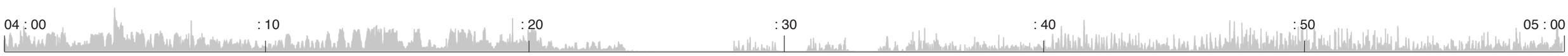
TURNTABLIST VOX

REVERSE FX

SPARSE PERCUSSION

DENSE TURNTABLIST VOX

TURNTABLIST STRINGS



TURNTABLIST VOX

REVERSE FX

CUT

SCRATCH FX

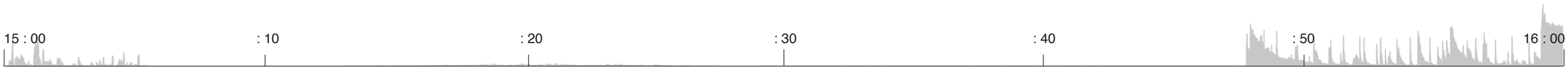
SOLO VOX CUT-UPS

LAYERED VOX CUT-UPS

SCRATCH FX

05 : 00
: 10
: 20
: 30
: 40
: 50
06 : 00
VOX CUT-UPS DROP OUT
SOLO SCRATCH FX
06 : 00
: 10
: 20
: 30
: 40
: 50
07 : 00
LAYERED SCRATCH FX
SCRATCH FX FADE
SCRATCH FX
VOX GRAINS
FIDGETY TRUMPET, PERC., PIANO & STRINGS
LOW LEVEL TRAIN
07 : 00
: 10
: 20
: 30
: 40
: 50
08 : 00
VOX GRAINS
VOX CUT-UPS
DECISIVE PIANO
RUBBLE GRAINS
INCREASING GRAIN SIZE
08 : 00
: 10
: 20
: 30
: 40
: 50
09 : 00
SKIDDING CELLO
VOX CUT-UPS
DECREASING GRAIN DENSITY
PERC.
GRAINS DROP OUT
09 : 00
: 10
: 20
: 30
: 40
: 50
10 : 00
WATERY AMBIENCE
REVERSE FX

10 : 00
: 10
: 20
: 30
: 40
: 50
11 : 00
WATERY AMBIENCE
DENSE SHORT STRINGS
WATERY AMBIENCE
REVERSE VIOLIN
11 : 00
: 10
: 20
: 30
: 40
: 50
12 : 00
DENSE SHORT STRINGS
WATERY AMBIENCE
SPARSE SHORT STRINGS
DENSE SHORT STRINGS
& AUTO FX
12 : 00
: 10
: 20
: 30
: 40
: 50
13 : 00
RUBBLE GRAINS
INCREASING DENSITY
WATERY GRAINS
VOX GRAINS
WATERY CYMBALS
GLISSING
TURNTABLIST VOX
13 : 00
: 10
: 20
: 30
: 40
: 50
14 : 00
TURNTABLIST VOX
GLASSY GRAINS
WATERY GRAINS
TRAIN
STRINGS
14 : 00
: 10
: 20
: 30
: 40
: 50
15 : 00
TURNTABLIST VOX
TURNTABLIST VOX FADE
VOX GRAINS
VOX GRAINS FADE
STRING GRAINS
STRINGS
TRAIN JOURNEY
TRAIN JOURNEY FADE

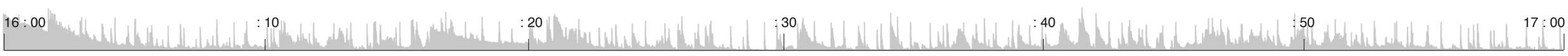


STRINGS
DROP
OUT

CUT

STATIC TRAIN INTERIOR

FUNKY / WONKY BEATS
MODERATE PERCUSSION & PIANO

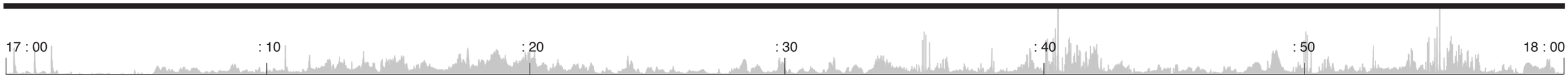


BEATS & PERC.

DUB FX

SKIDDING CELLO

BEATS
DROP
OUT



GRAINS

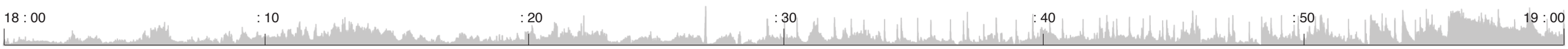
TRUMPET

DUB FX

SCRATCH FX

TAPE FX

TRAIN FX

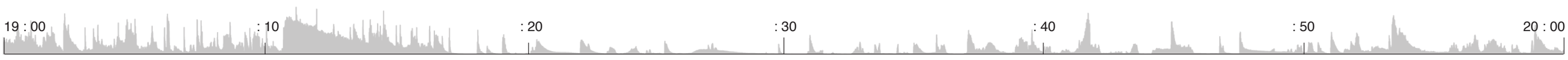


CELLO SCRAPE

DECISIVE PIANO

BEATS

TRUMPET



SPARSE PERCUSSION

CLEAN TRUMPET

SPARSE PERC. & PIANO
BLOWNOISE
CLEAN TRUMPET
REVERSE PIANO & CYMBALS
DISTORTION FX

TRUMPET
PHRASE

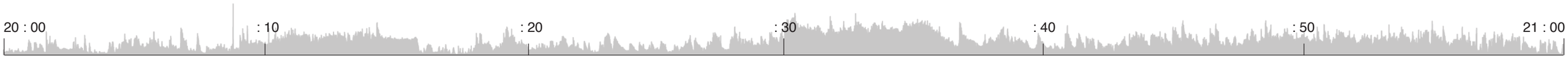
BEATS
DROP OUT

DISTORTION FX

BLOWNOISE

REVERSE PIANO & CYMBALS

STRINGS



SPARSE PERC. & PIANO
BLOWNOISE
CLEAN TRUMPET
REVERSE PIANO & CYMBALS
DISTORTION FX

TRUMPET

GRAIN STRINGS

SPARSE PERC. & PIANO

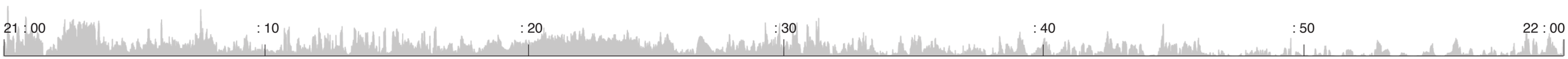
DECISIVE PIANO

INCREASING DENSITY

QUICK CHANGE

FILTER VOX & FX

GRAIN STRINGS



TRUMPET

GRAIN STRINGS

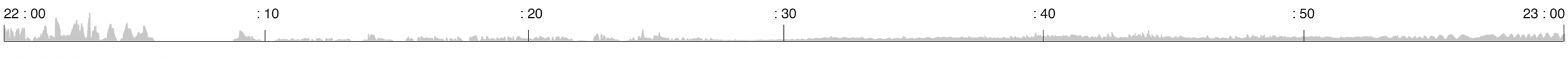
TRUMPET

TURNTABLIST VOX

SPARSE TURNTABLIST CYMBALS

TRUMPET

STRINGS

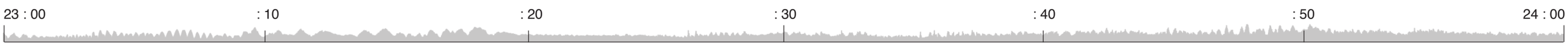


TURNTABLIST VOX DROP OUT

CUT

ANN. “CLOSED” TIMESTRETCHED STRINGS

TRAIN CLATTER



TRAIN DOORS HISS

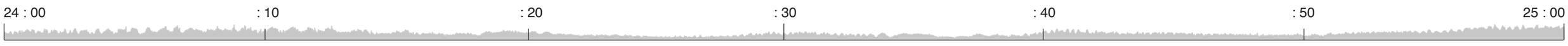
WOODWINDS

TRAIN DOORS HISS

TRAIN PULLS AWAY

TRAIN CLATTER

HORNS



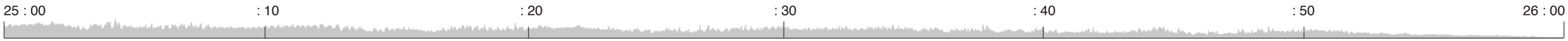
FADE

TRAIN DOORS HISS

FLUTES

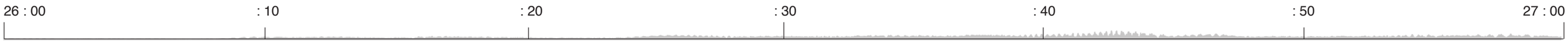
TRAIN DOORS HISS

LUSH STRINGS



TRAIN PULLS AWAY

TRAIN FADE

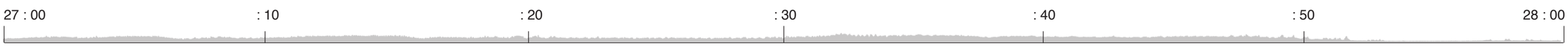


STRINGS

HEART STRINGS

VOX

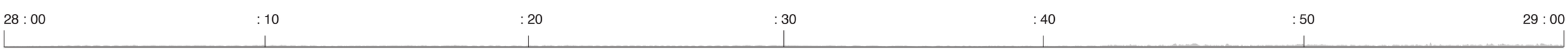
WOODWINDS



PIANO

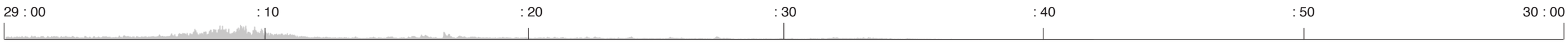
ANN. “APOLOGIES FOR THE WAIT”

TREM STRINGS



TRAIN PULLS AWAY & GLISS

STRINGS FADE



TRAIN CLATTER

ANN. “THIS IS BRIXTON”

FADE