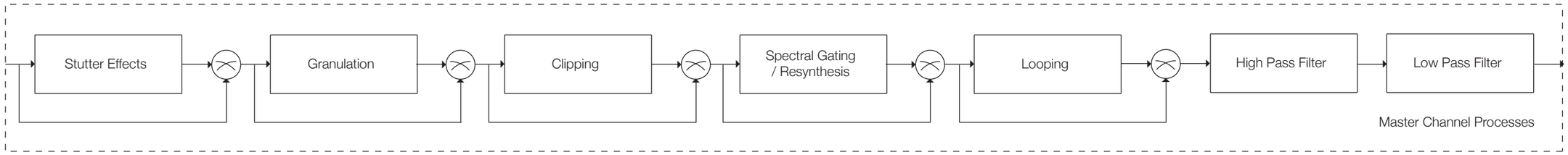
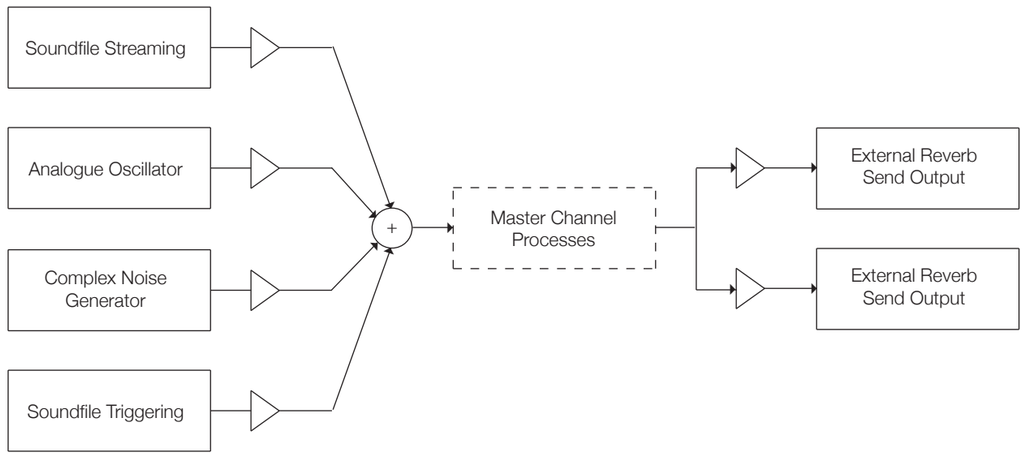
Radio | Silence

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

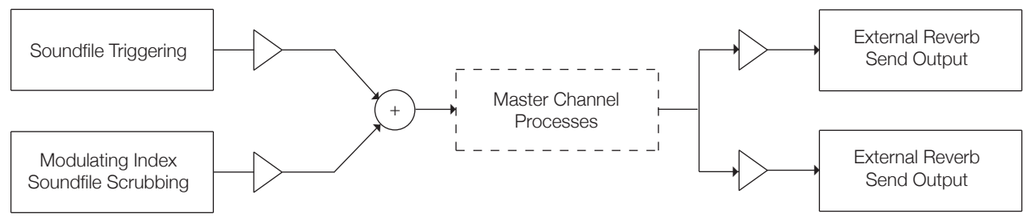
Submitted in part satisfaction of the requirements for
the degree of PhD in the University of Edinburgh, 2011



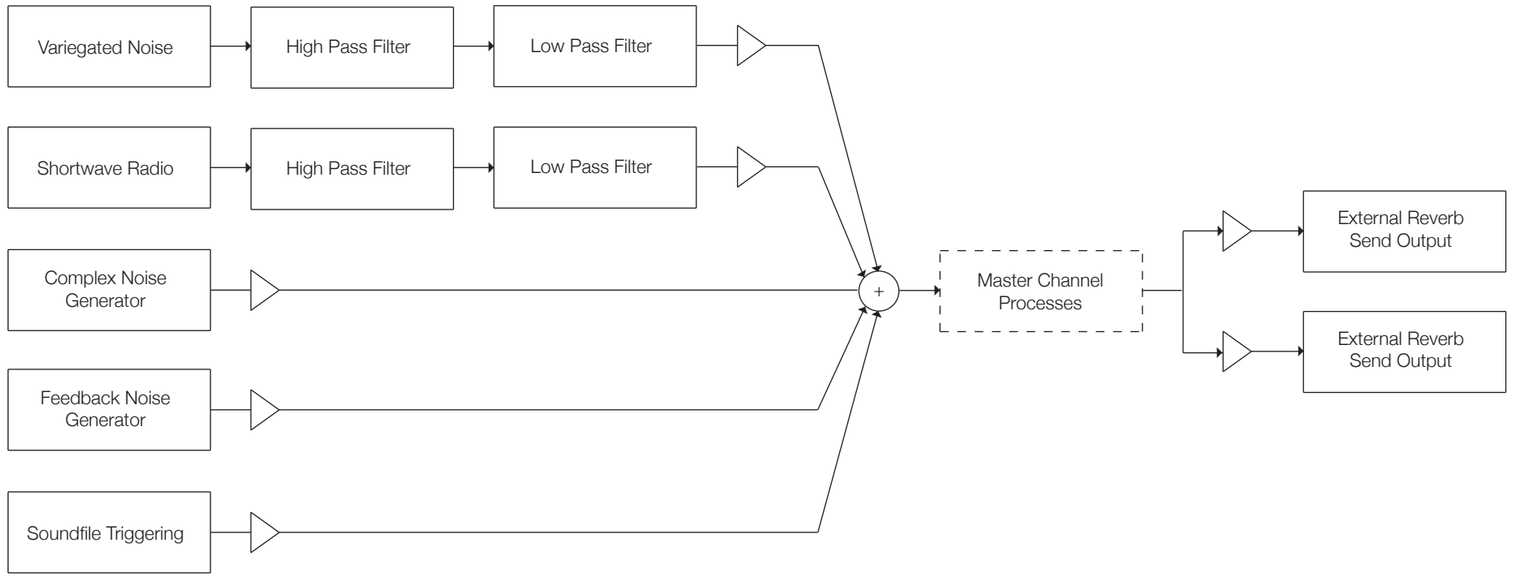
PLAYER 1

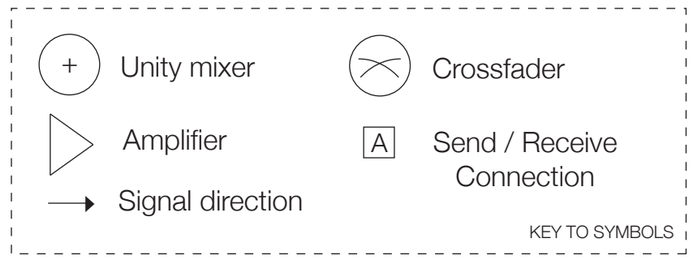


PLAYER 2



PLAYER 3





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.

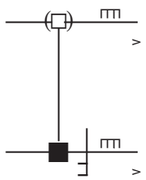
The final classes of events are accumulations (rapid clusters of events) and soundwebs (interwoven material comprising all other classes, played here as precomposed soundfiles).

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.

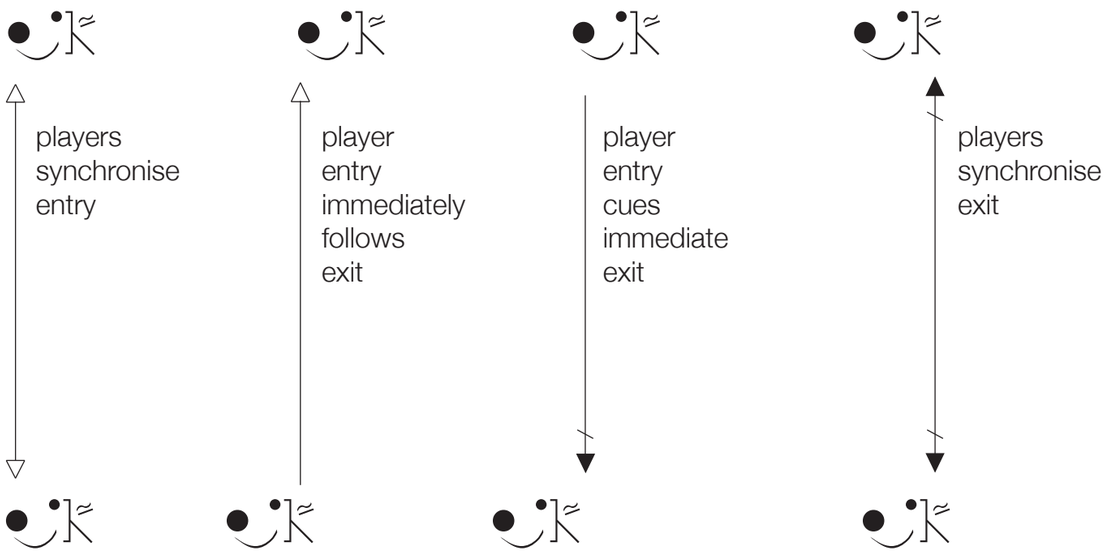
Object types can be connected with a vertical line indicating pitch and/or bandwidth stratification of a single object, with some spectral and morphological indications presented in parentheses. In this case, height on the frequency axis represents a central bandwidth for each component, regardless of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

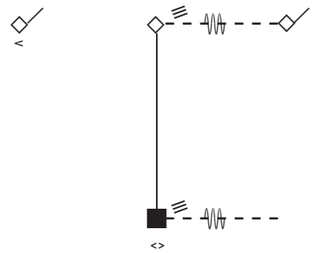


Score examples, instrument performance guides and special cases

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.

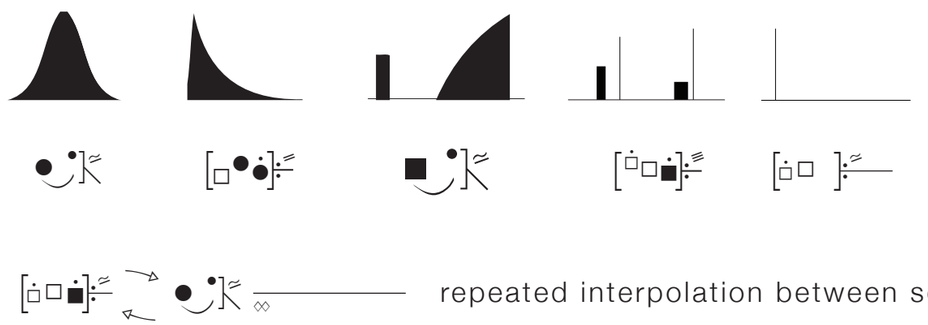
e.g:



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.



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.

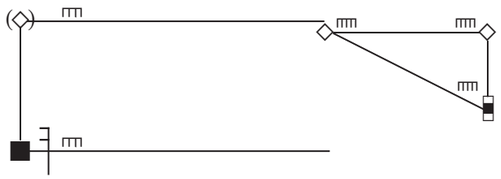
jr.noisegen provides the following controls for shaping its output.

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

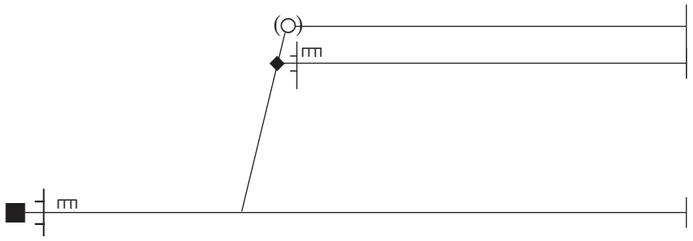
Selecting 'sah' in the clock source can cause desirable dropouts when coupled with 'lp' filter selection.

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.



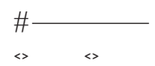
e.g. complex granular, saturated noise in the low register, widening to include inharmonic and sine partials.

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.

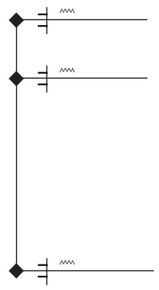
The radio is articulated using short gestures on the tuning control, with amplitude controlled by the radio's volume dial.

 composite gesture

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

Feedback (Player 3)

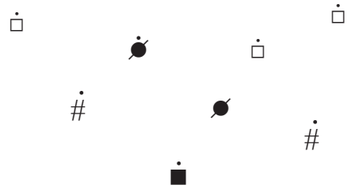
The feedback instrument, jr.feedbacker, is used at 2 points in the performance (5'31-48 & 11'35-45), and is scored as a chord of saturated, inharmonic noise.



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)

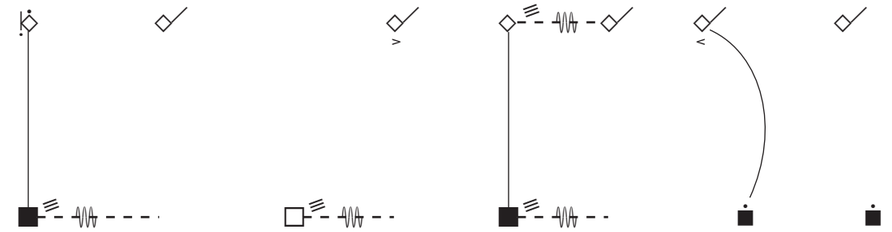
mdeGranular~ - http://www.michael-edwards.org/software/mdegranular/
(Michael Edwards)

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***

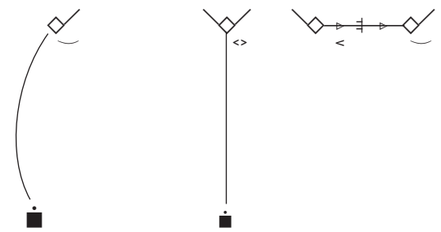
FREQUENCY

PLAYER 2

FREQUENCY

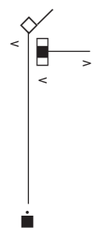
PLAYER 3

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

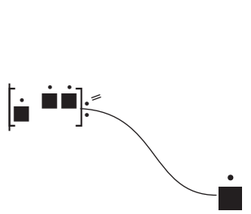


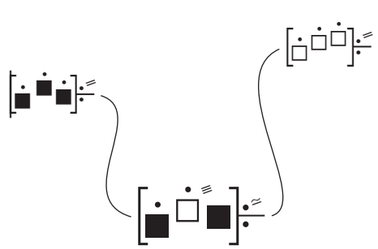
p

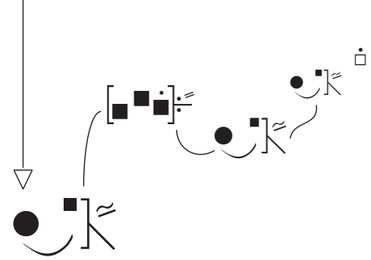
f

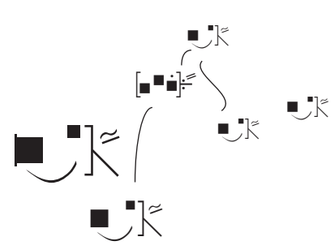


ff









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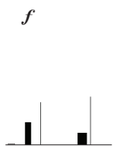
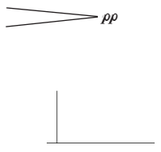


f

f



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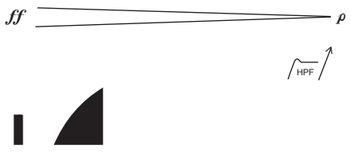
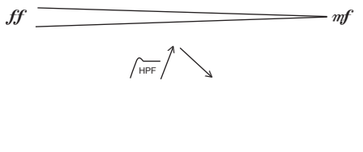


ff *p*

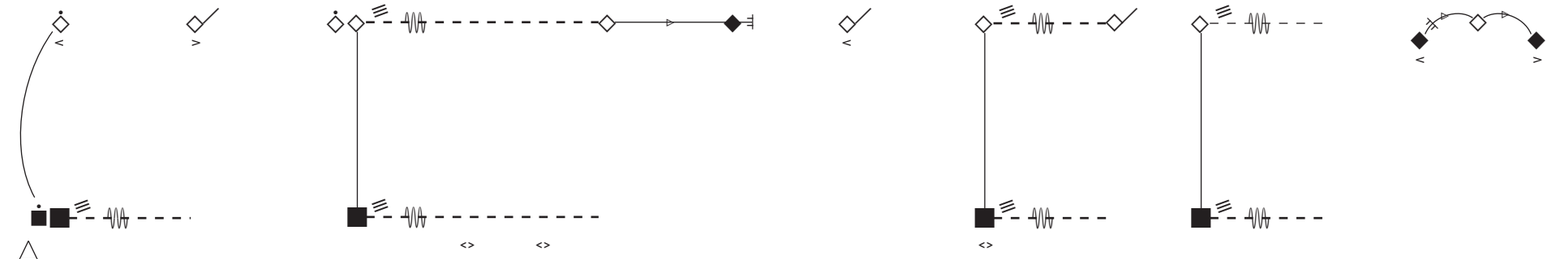
HPF



ff *mf*

HPF

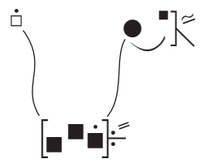
1 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

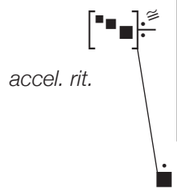


f

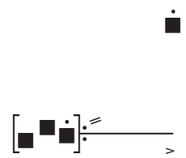
CUE 01

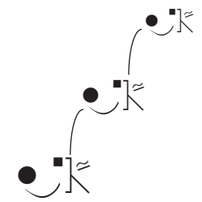
CUE 02





accel. rit.





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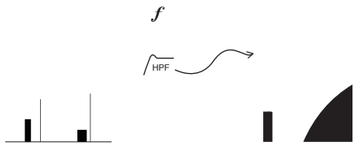
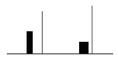


mf

p



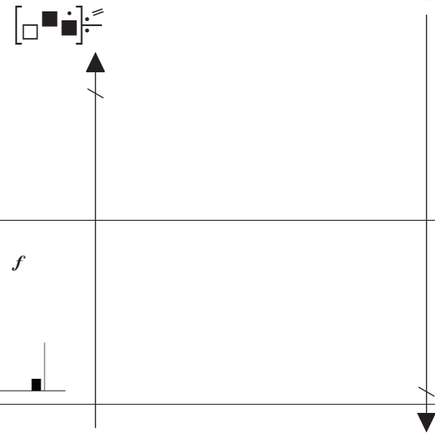
f

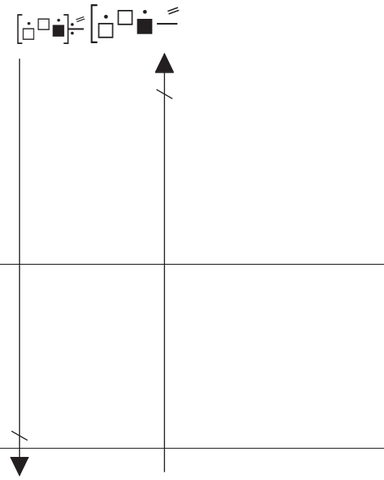
f

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





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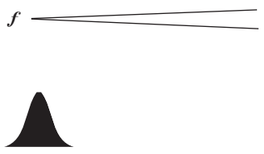
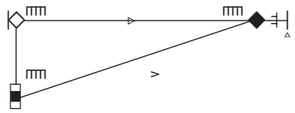


f

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



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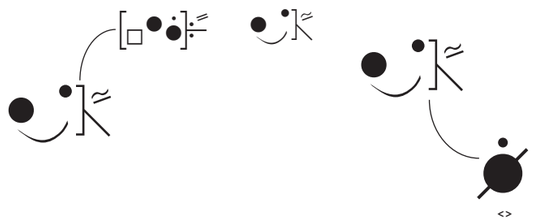

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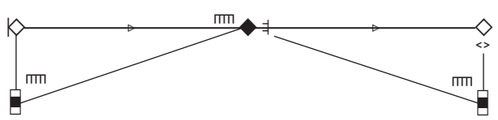
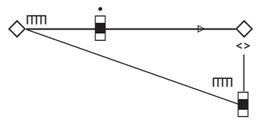
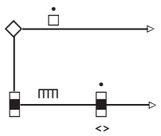




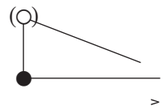


f

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



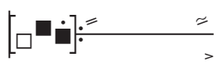
mp *f*

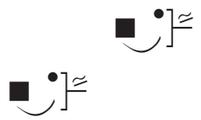
CUE 04

f *mp*

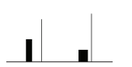
CUE 05

irregular phrasing





mf



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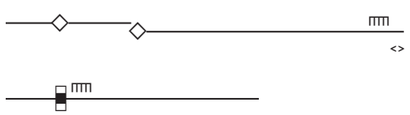
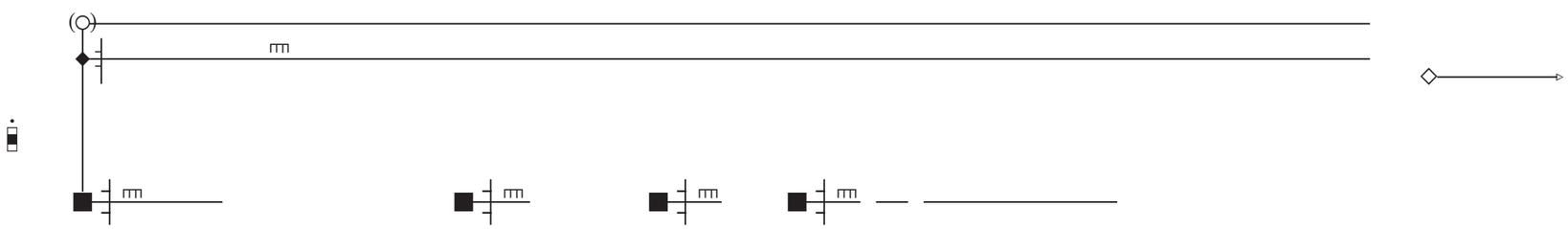
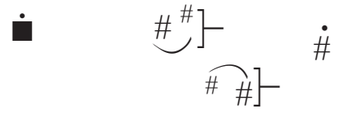




f

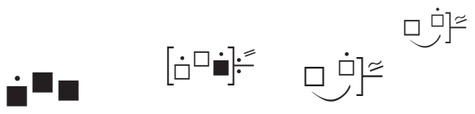
3 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30



f *mf* *mp*

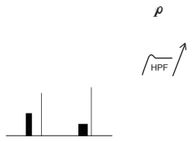
CUE 06

CUE 07



accel. rit.

p



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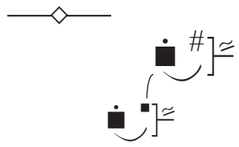
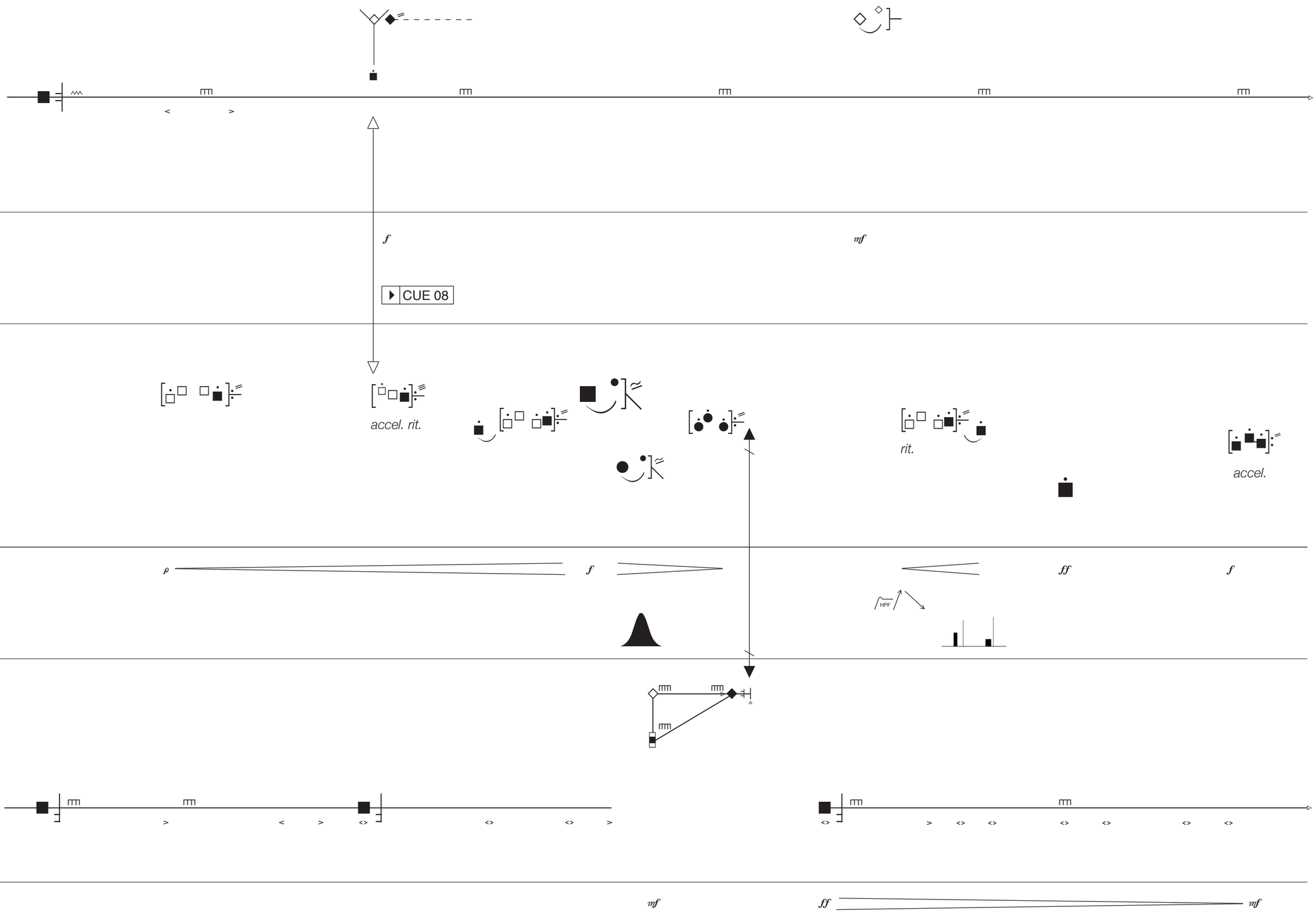
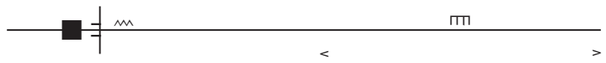


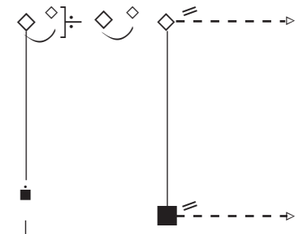
mp *mf*

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



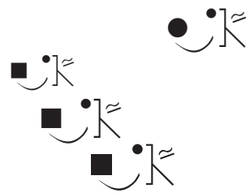
4 :00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

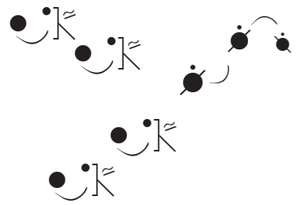




mf

CUE 09





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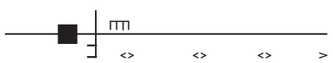
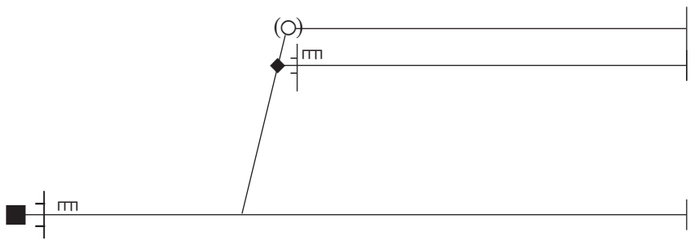
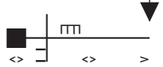


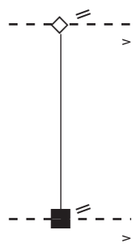
ff

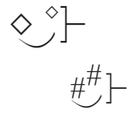


mf



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





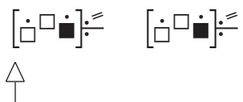
f

mf

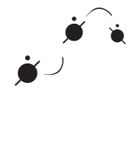
CUE 10

mf

CUE 11



accel. rit.

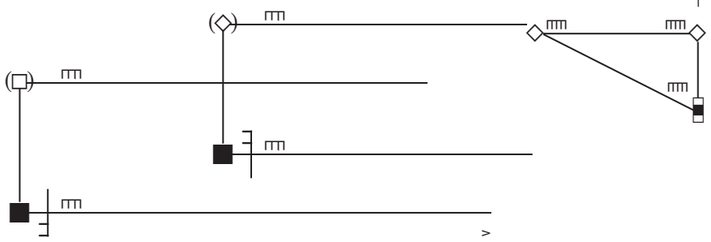


accel. rit.

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

CUE 12

CUE 13

CUE 14

accel. rit. *rit.*

accel. rit.

accel. rit.

accel. rit.

mp

HPF

f

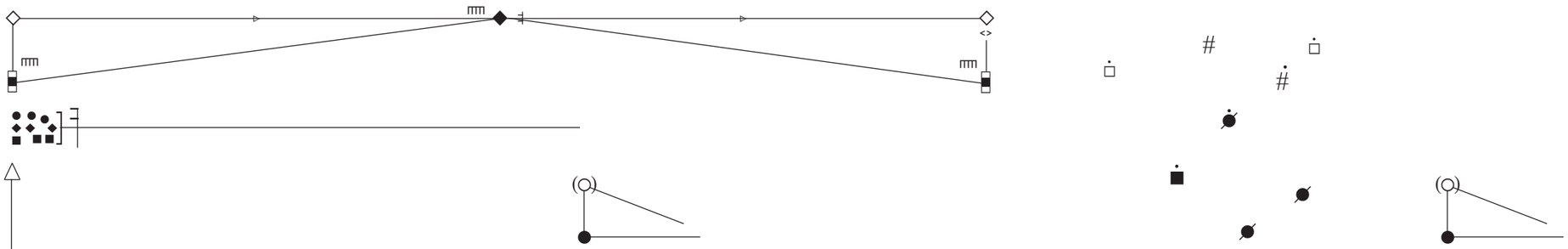
ff

f

mf

HPF

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

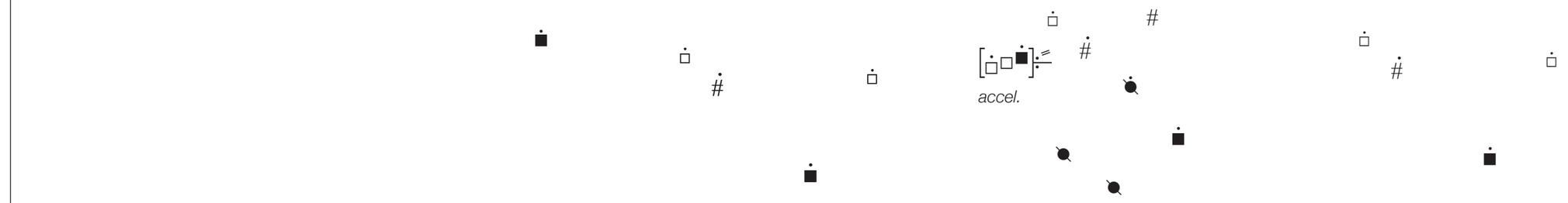
mf

mp

CUE 15

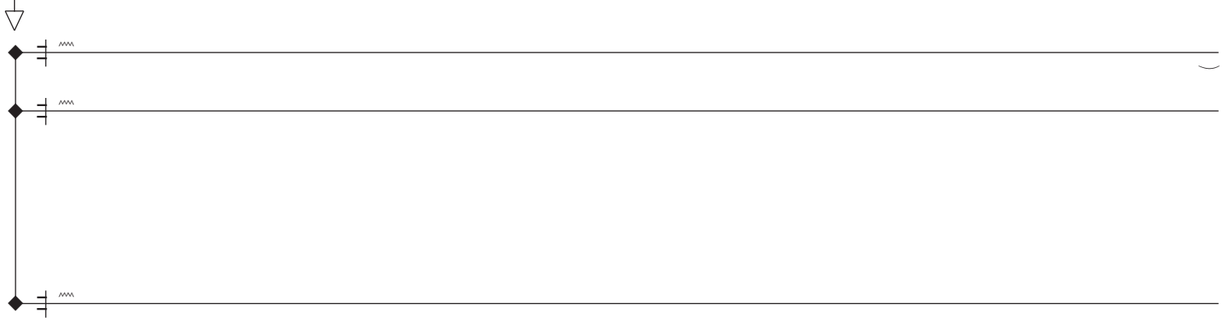
CUE 16

CUE 17



ff

mf

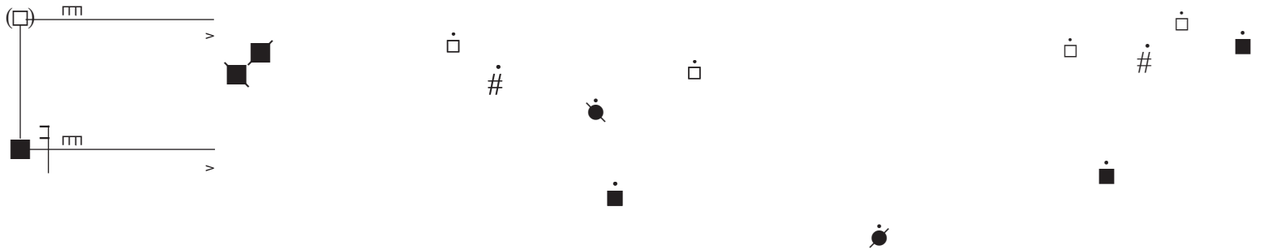


fff

mf

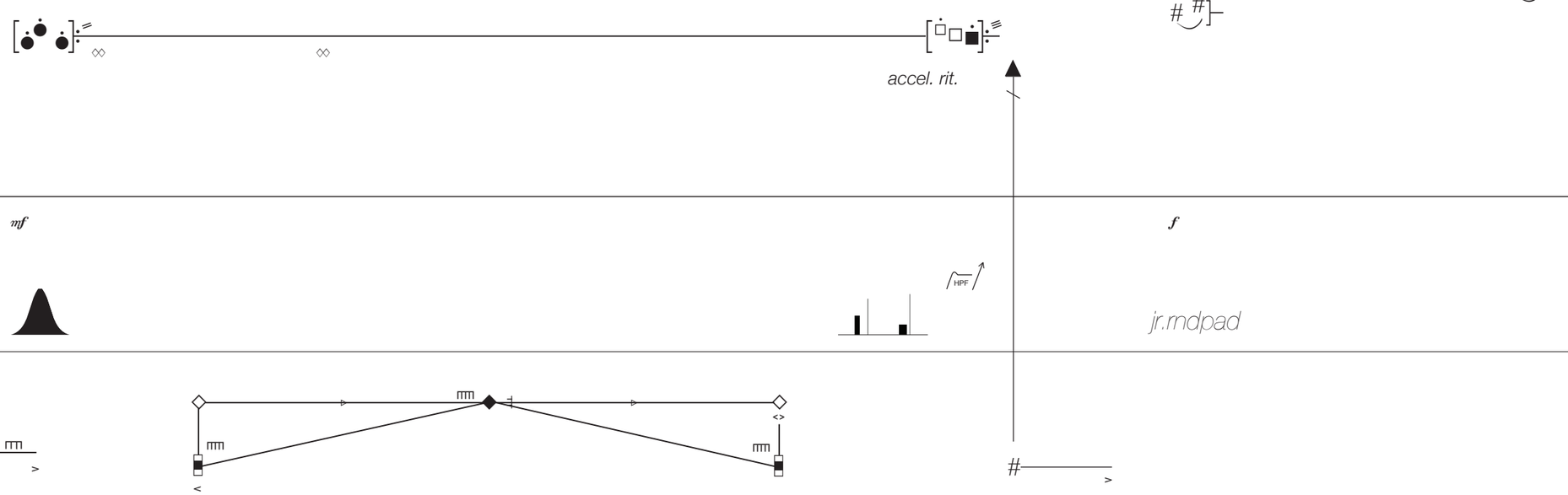
mp

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*

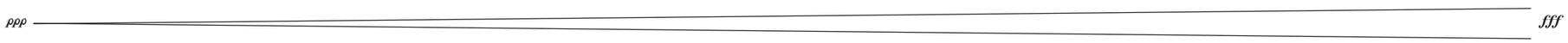
CUE 18



mf *f*

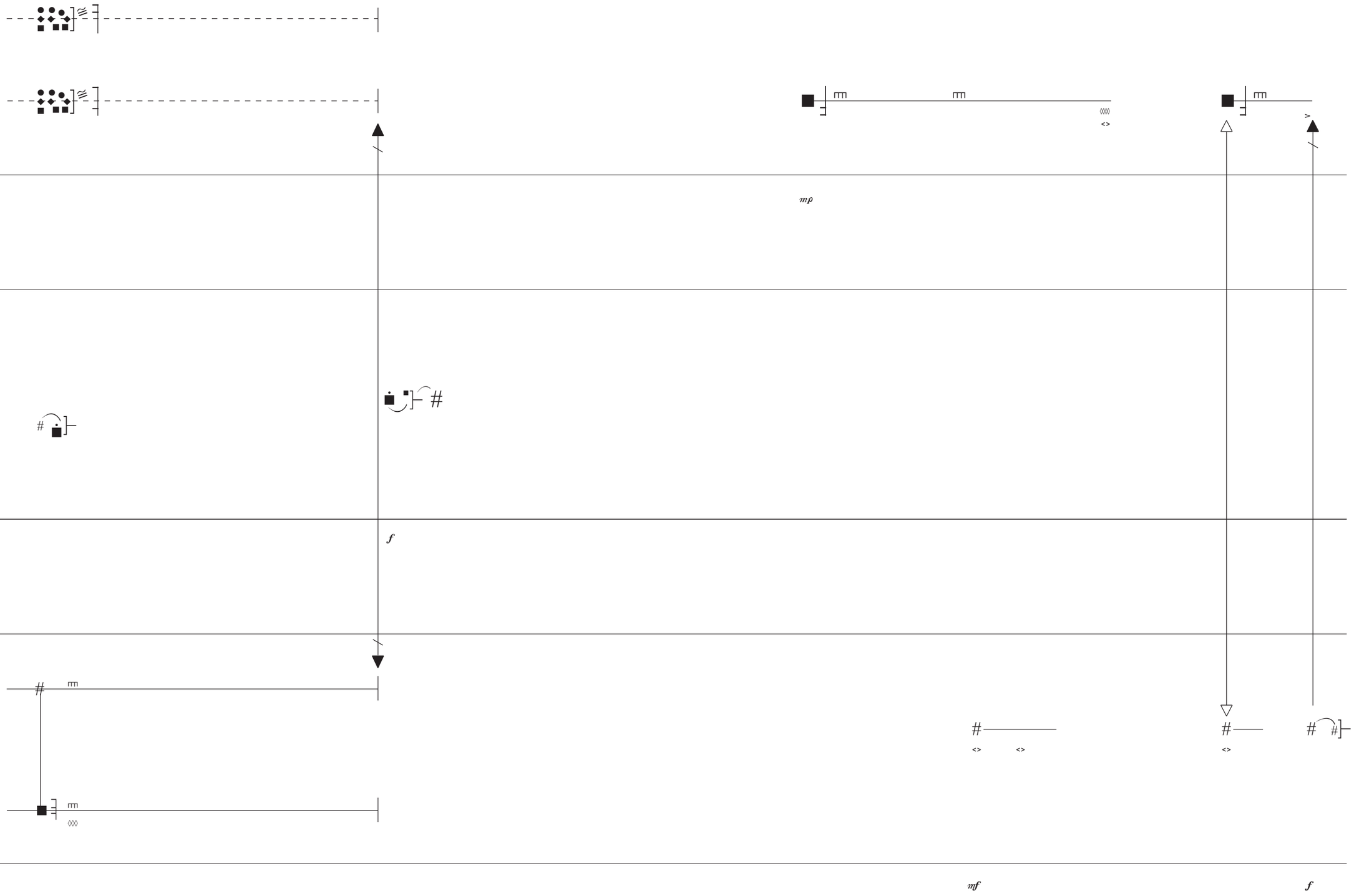
mp *mp* *ppp*

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

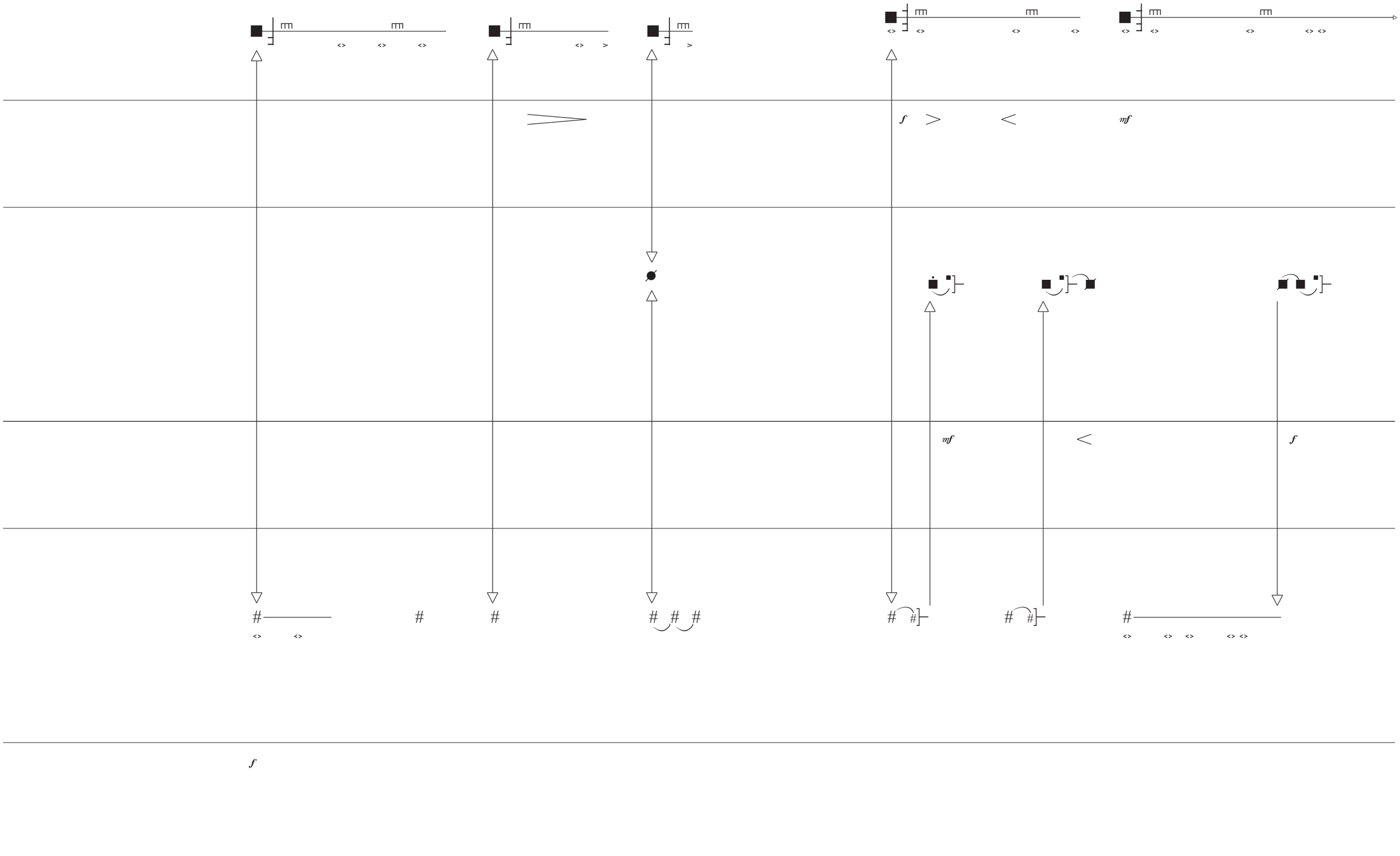


7:00 :01 :02 :03 :04 :05 :06 :07 :08 :09 :10 :11 :12 :13 :14 :15 :16 :17 :18 :19 :20 :21 :22 :23 :24 :25 :26 :27 :28 :29 :30

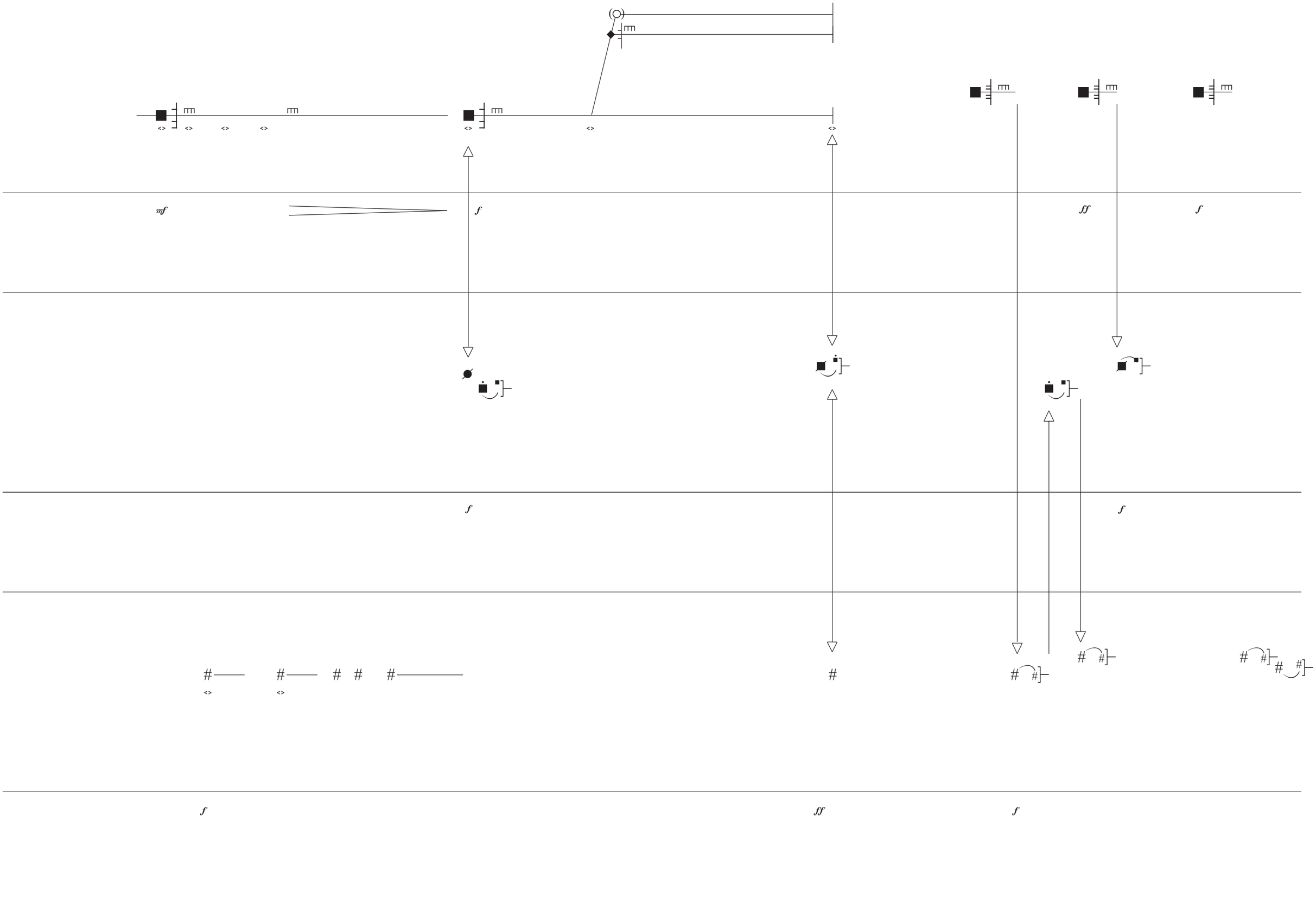
SECTION 2



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

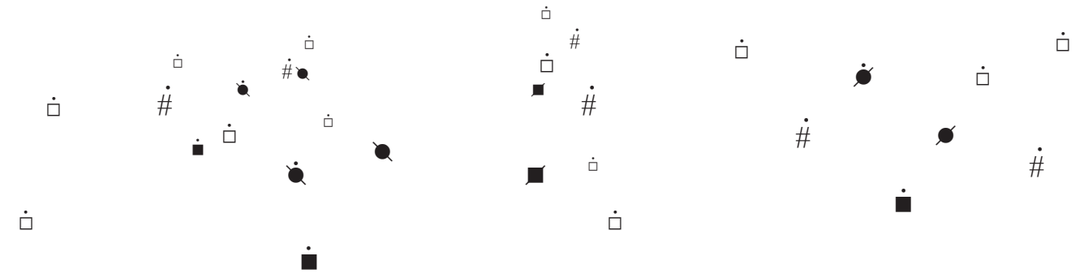
CUE 24

mp

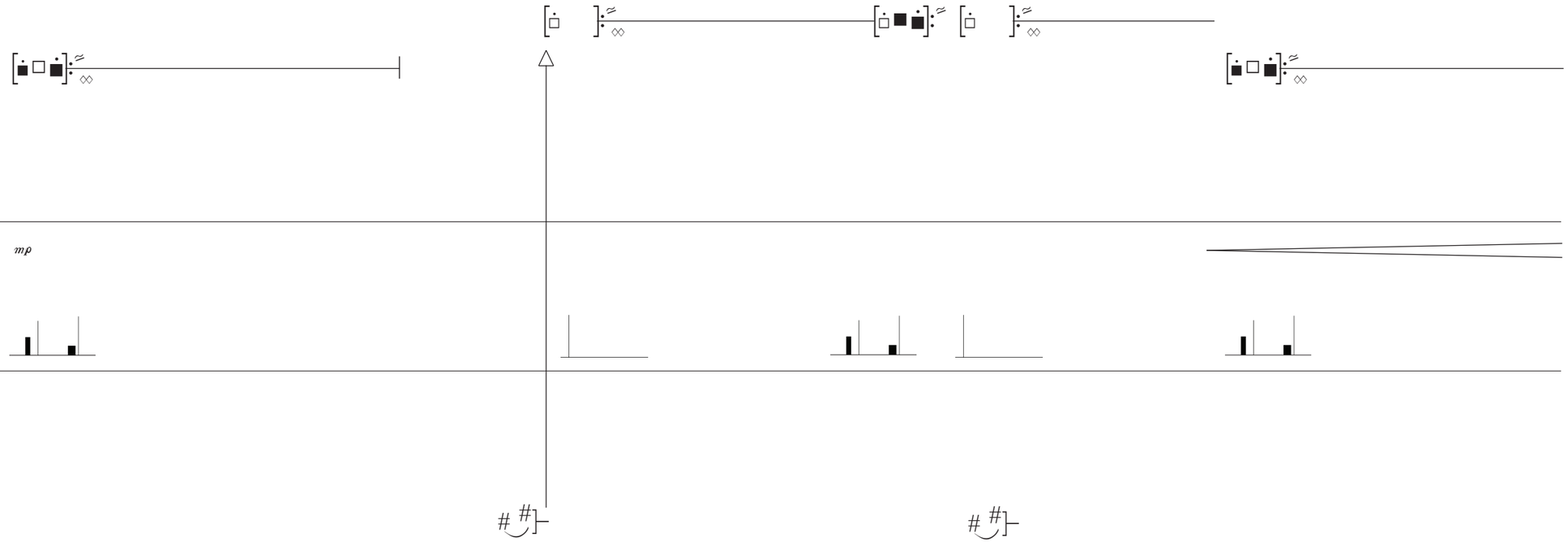
ff

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

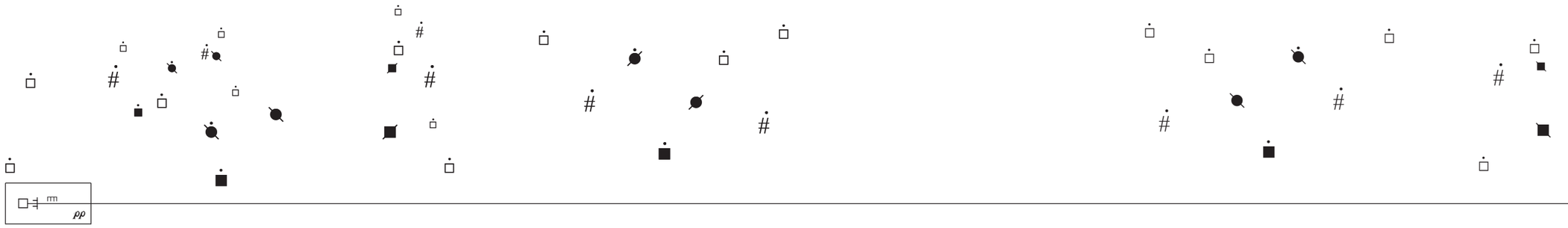
SECTION 4



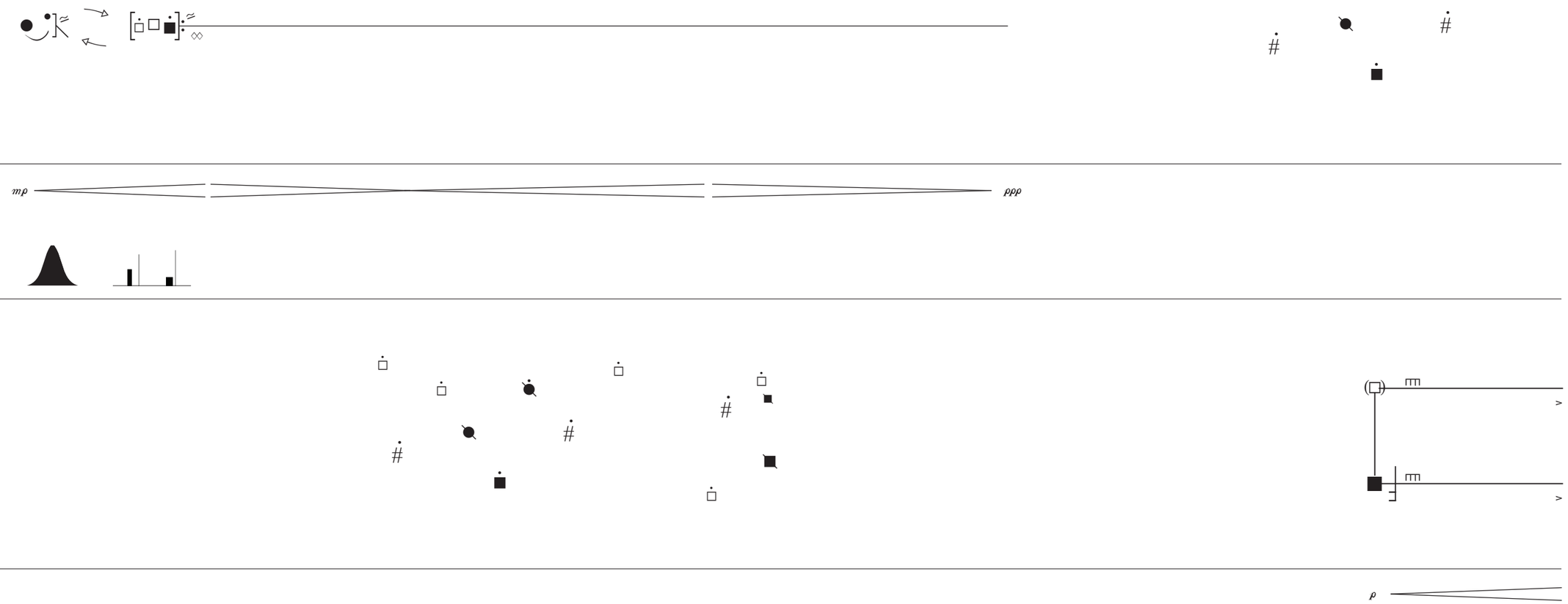
mf *f*



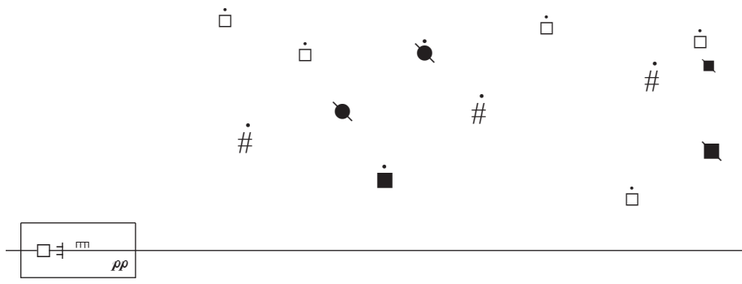
13:00 :15 :30 :45 :00

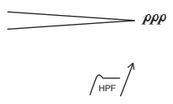


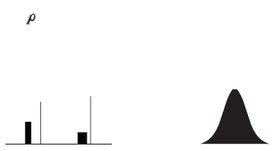
CUE 25

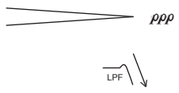


14:00 | | :15 | | :30 | | :45 | | :00





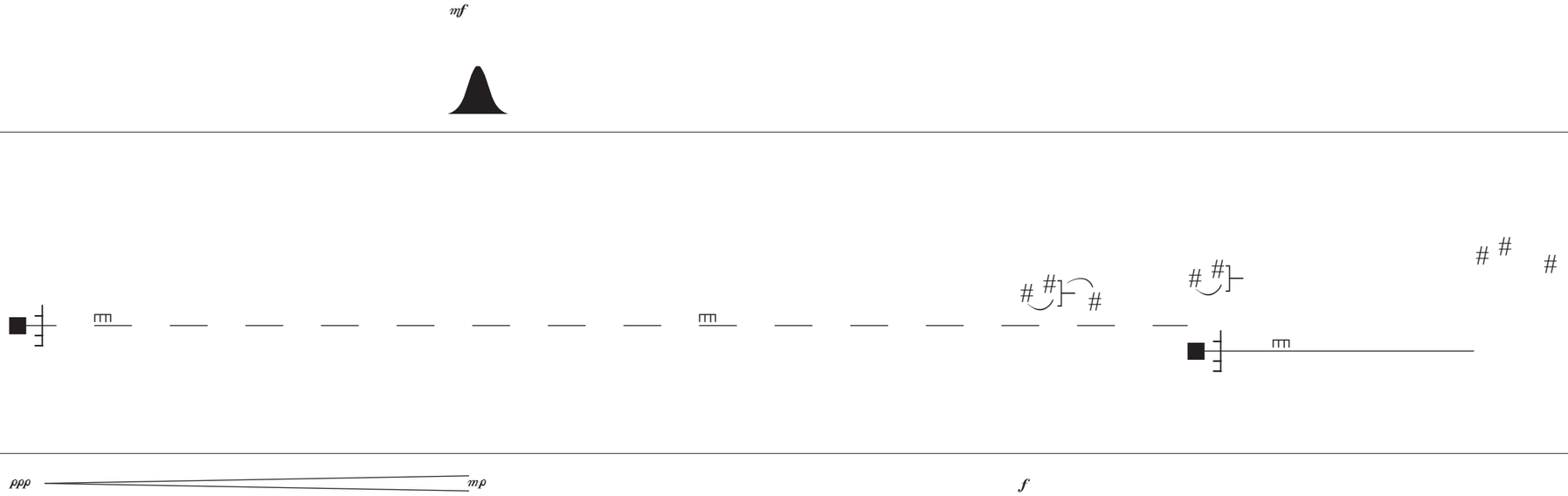




15:00 | :15 | :30 | :45 | :00

SECTION 5

CUE 26



16:00 :15 :30 :45 :00

mf *f* *ppp* *fff*

CUE 27

mf *fff*

ppp *f* *mp* *fff*