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2015

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# flint
# for ensemble mosaik

by

Rama Jesse Gottfried

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Music

and the Designated Emphasis

in

New Media

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Franck Bedrossian, Chair
Professor Edmund Campion
Professor Cindy Cox
Professor Gregory Niemeyer

Spring 2015

**Abstract**


flint
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Doctor of Philosophy in Music

and the

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University of California, Berkeley

Professor Franck Bedrossian, Chair

Striking flint rock against iron pyrite, tiny sparks leap from seemingly nowhere into existence. Like the combination of sounds, when a spark contacts flammable material a flame forms; expanding and transforming as it grows, feeding itself on the material, continuing until it has released as much of the material's content as it can before diffusing into the air.

The machinery of life follows a similar progression – from the microscopic drama of atoms, cells, neurons, leaves, amoebas, and digital bits – to the macro-scale drama of lives, societies, and universe-sized ecosystems.

The piece *flint* for ensemble mosaik, is not universe-sized, but instead is comprised of millions of microscopic lives and deaths in sound.

By magnifying these most minuscule of sonic gestures through extreme amplification and human computer interaction instrument systems, the work extends the gestures of the ensemble and reaches into the space around the listeners.

*flint* was premiered by ensemble mosaik at the Bluderzer Tage zeitgemäßer Musik Festival in Bludenz, Austria, November 2014.

for Sophie

**Acknowledgments**

I dedicate this dissertation to my family who has supported me through many years of study, and especially to my amazing wife Celeste who has given me the courage to keep going whenever doubts creep in, and my daughter Elodie who reminds me of the importance of play.

I would like to also acknowledge the many teachers I have had through my academic career, starting with T.L Read, and Ernest Stires who told me I was a composer, Justin Dello Joio, Nils Vigeland, Marc Sabat, and Walter Zimmermann.

In particular, I would like to acknowledge the intellectual engagement of the faculty at UC Berkeley: David Wessel, Edmund Campion and Adrian Freed at the Center for New Music and Audio Technologies who have guided my work and holistic growth as an artist and technologist; Franck Bedrossian whose careful listening and thoughtful reflections have greatly refined my aesthetic handling of material; and at the Berkeley Center for New Media, Abigail De Kosnik and Greg Niemeyer who helped expand my artistic and scholarly thinking putting me in dialog with other graduate students from many other backgrounds.

Thank you.

## instrumentation:

piccolo with internal mic, handheld speaker
oboe with internal mic, handheld speaker
clarinet in Bb with internal mic, handheld speaker
soprano saxophone with close mic, handheld speaker

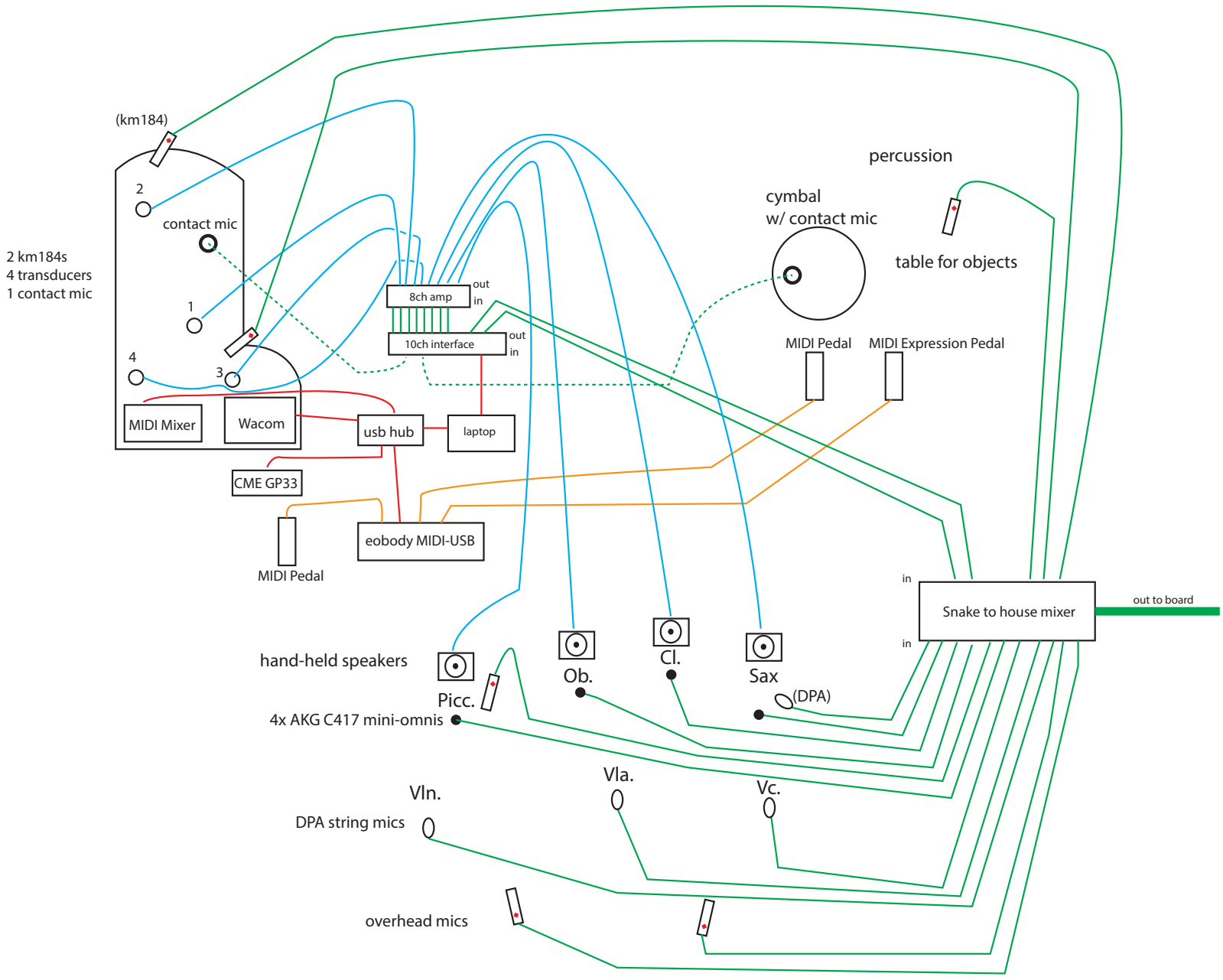
percussion:
    close mic:
        plant pot base
        cleaning brush on bongo drum
        2 rocks
    cymbal with contact mic
    midi pedals (see schematic)

piano:
    wacom tablet computer interface
    4 transducers
        attached to various objects sitting on piano strings:
            wooden frog
            tibetian bowl
            piece of wood
        unattached ping-pong balls
    midi pedals and mixer (see schematic)

violin
viola
violoncello

## duration: ca. 12 minutes

schematic




audio cables

speaker cable

MIDI pedal cable (1/4")

computer cables (usb or firewire)

note:
for best results all winds should have compression and EQ to create a highly flat, electronic sound. boost extreme low and high frequency ranges for maximum boom and click.

MacBook Pro
Wacom tablet
MIDI mixer (UC-33, BCF2000 or sim)
CME GP33 Foot pedal
eobody MIDI-USB
2x MIDI Pedals
1x MIDI Expression pedal
USB hub

10ch audio interface (FF800 or sim)
8ch amplifier

4x small transducers (Dayton Audio)
6x KM184 (or sim)
4x AKG C417 (or sim)
3x string DPA (or sim)
1x sax DPA (or sim)
2x contact mics
4x small handheld speakers (with housing)

# piccolo

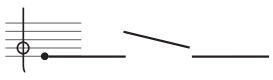
equal temperament (ET)

±14 cents from ET)

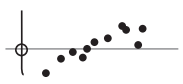
±31 cents from ET

±50 cents from ET

relative pitch of keyclick/air-noise around held note.
where the held note continues, there should also be a click.



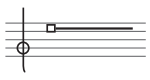
relative key glissando from held note.



relative pitch of fingering/click, relative to the G on the treble cleff.



light air tone not on staff, slight to no pitch



light air tone on staff, slightly more tone than above



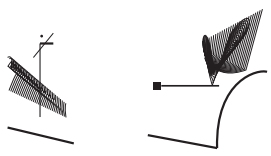
heavy air tone, forceful air pressure, with mouth covering embouchure.

amplification:
a small omni-directional microphone should be placed inside the instrument, wrapped with plastic-wrap to avoid water damage. for the piccolo, the mic should be placed inside the end of the instrument, and secured with a rubber band to keep the mic in place. the gain to the PA speakers should be quite loud, and should be compressed, and EQ'd with boosts in the very low and very high ranges -- as loud as possible without feeding back. some distortion is desirable, for example, with the "heavy air tone".

graphic notation:
for some techniques in the piece, graphic notation is used to visually describe the resulting sound. in general, the vertical position of a shape refers to the relative pitch of the sound, while the vertical width and darkness of the shape indicates the relative loudness of the sound. the internal variations of each shape indicate that a change in quality should be apparent, for instance this might possibly achieved by changing the embouchure shape.



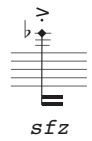
flutter-whistle tone: fluttertounge technique with throat plus whistletone, a high frequency sound, with a bouncing rhythm a bit like a small stone skipping on water



motor sound: a low-pitch fluttertounge technique with throat, with the mouth completely covering the embouchure hole. the resulting sound should be something like a motorcycle. usually combined with keyclick glissando, and heavy air sound. see also the general graphic notation explanation.

ingressive, lip sound
very high pitch with irregular rhythm, and density. here, the staccato 16th note at end indicates as sharp ending point.

staccatissimo, dead tongue sound, click-like.




staccatissimo, pizzicato

---

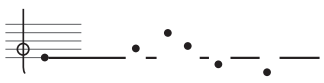
# oboe

equal temperament (ET)

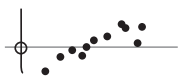
±14 cents from ET)

±31 cents from ET

±50 cents from ET



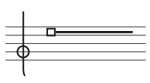
relative pitch of key fingering/click around held note.
where the held note continues, there should also be a click.



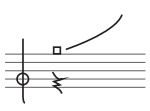
relative pitch of fingering/click, relative to the G on the treble clef.



light air tone not on staff, slight to no pitch



light air tone on staff, slightly more tone than above, should be an "almost" pitch, with a light, unstable grittiness.



air fluttertongue with relative pitch keyclick glissando

amplification:
a small omni-directional microphone should be placed inside the instrument, wrapped with plastic-wrap to avoid water damage. for the oboe, the mic should be placed inside instrument approximately at the mid point, and secured with a rubber band by the cable at the bell to keep the mic in place. the gain to the PA speakers should be quite loud, and should be compressed, and EQ'd with boosts in the very low and very high ranges -- as loud as possible without feeding back.

graphic notation:
for some techniques in the piece, graphic notation is used to visually describe the resulting sound. in general, the vertical position of a shape refers to the relative pitch of the sound, while the vertical width and darkness of the shape indicates the relative loudness of the sound. the internal variations of each shape indicate that a change in quality should be apparent, for instance this might possibly achieved by changing the embouchure shape.

"geiger-counter": staccatissimo, ingressive breath, dead tongue sound, very short click sounds. possibly best produced with strong embouchure pressure, with the reed at the side of the mouth.

air fluttertongue -- even though the notehead is black here, the result should be a bit more pitch than the light air-tone on the staff, but not a full bodied pitch.

ingressive, lip sounds
very high pitch with irregular rhythm, and density. in example "a" the staccato 16th note at end indicates as sharp ending point. example "b" is similar, but with more interpretive variation. see also the general graphic notation explanation.

# clarinet Bb

equal temperament (ET)

±14 cents from ET)

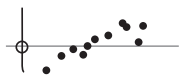


±31 cents from ET



±50 cents from ET

relative pitch of keyclick/air-noise around held note.
where the held note continues, there should also be a click.



relative pitch of fingering/click, relative to the G on the treble cleff.



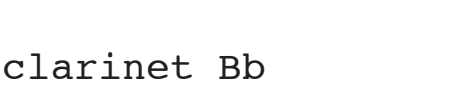
light air tone not on staff, slight to no pitch



light air tone on staff, slightly more tone than above,
should be an “almost” pitch, with a light, unstable grittiness.



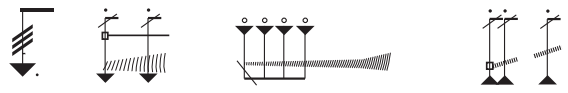
air fluttertongue with relative pitch keyclick glissando




ingressive, lip sounds
very high pitch with irregular rhythm, and density. in example “a” the staccato 16th note at end indicates as sharp ending point.
example “b” is similar, but with more interpretive variation.
see also the general graphic notation explanation.

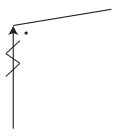
amplification:
a small omni-directional microphone should be placed inside the instrument, wrapped with plastic-wrap to avoid water damage. for the clarinet, the mic should be placed inside the middle of the instrument, and secured with a rubber band or tape to keep the mic in place. the gain to the PA speakers should be quite loud, and should be compressed, and EQ’d with boosts in the very low and very high ranges -- as loud as possible without feeding back.

graphic notation:
for some techniques in the piece, graphic notation is used to visually describe the resulting sound. in general, the vertical position of a shape refers to the relative pitch of the sound, while the vertical width and darkness of the shape indicates the relative loudness of the sound. the internal variations of each shape indicate that a change in quality should be apparent, for instance this might possibly achieved by changing the embouchure shape.




a: slap-tongue tremolo, many many slap-tongues, as fast as possible
b: staccatissimo tongue slaps, with fluttertongue (throat) air at the same time
c: air fluttertongue (throat) with short, slap-tongue multiphonics (overtones)
d: ingressive air sound, with staccatissimo ingressive slap-tongue

“whistlers” -- very high whistle-like sounds, produced with lots of embouchure and air pressure, plus a little spit on the reed. depicted graphically -- see also the general graphic notation description.



teeth on reed -- very high whistle sound

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# soprano saxophone

equal temperament (ET)

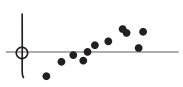
±14 cents from ET)

±31 cents from ET



±50 cents from ET

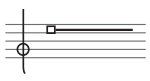
relative pitch of keyclick/air-noise around held note.
where the held note continues, there should also be a click.



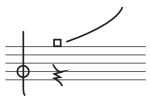
relative pitch of fingering/click, relative to the G on the treble clef.



light air tone not on staff, slight to no pitch



light air tone on staff, slightly more tone than above,
should be an “almost” pitch, with a light, unstable grittiness.

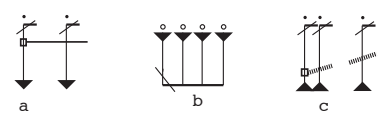


air fluttertongue with relative pitch keyclick glissando

ingressive, lip sounds
very high pitch with irregular rhythm, and density. in example “a” the staccato 16th note at end indicates as sharp ending point.
example “b” is similar, but with more interpretive variation.
see also the general graphic notation explanation.

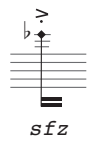
amplification:
the saxophone uses a DPA mic, with gooseneck clip mounted on the instrument so that mic is over the keys, approximately at the mid-point between the two hands. the gain to the PA speakers should be quite loud, and should be compressed, and EQ’d with boosts in the very low and very high ranges -- as loud as possible without feeding back.

graphic notation:
for some techniques in the piece, graphic notation is used to visually describe the resulting sound. in general, the vertical position of a shape refers to the relative pitch of the sound, while the vertical width and darkness of the shape indicates the relative loudness of the sound. the internal variations of each shape indicate that a change in quality should be apparent, for instance this might possibly achieved by changing the embouchure shape.



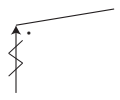

a: staccatissimo tongue slaps, with fluttertongue (throat) air at the same time
b: short, slap-tongue multiphonics (overtones)
c: ingressive air sound, with staccatissimo ingressive slap-tongue

“spit whistlers” -- a percussive fluttertongue sound, produced by adding a little spit into the reed and angling the bell of the instrument upwards, so as to keep the water in the reed. the resulting sound should not sound like heavy gurgling, but a light, somewhat transparent pitched sound. depicted graphically -- see also the general graphic notation description.



*sfz*

staccatissimo, dry slap-tongue

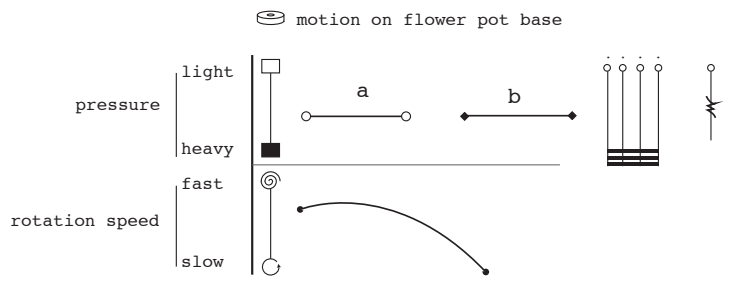


teeth on reed -- very high whistle sound

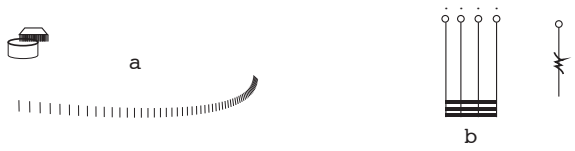
# percussion

hard brush on bongo
flower pot base
two rocks
bowed cymbal with contact mic

amplification:
at least two mics are used, one or two for the flower pot base, brush on bongo, and rocks -- a contact mic is taped to the cymbal and is routed into the piano/wacom computer interface.




a: open circles are finger tips
b: black diamonds are the back of the finger nail

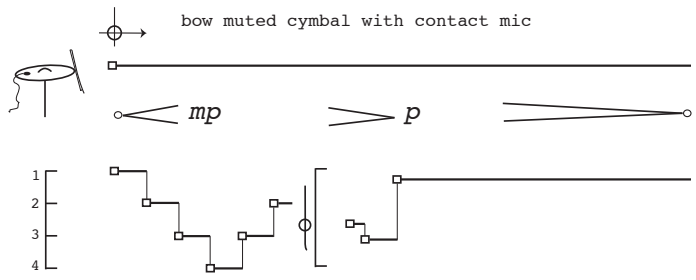



hand brush on bongo drum -- three main sounds are used:
(1) a gradient of rhythms created by moving the bristles against the drum head at different speeds and pressures, from sparse clicks, to white noise,
(2) changing the relative pitch of the bristles, by using the other hand to alter the resonance of the drum head, and
(3) rubbing the handle of the brush (smooth plastic) against the drum head to produce a slightly more pitched noise sound, the frequency of which is controlled by rubbing closer or further from the rim of the drum head.

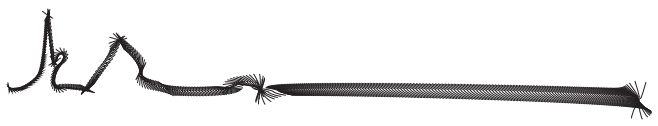
a: bristle sounds with graphically depicted results -- the relative vertical position indicates pitch, and the horizontal density indicates rhythm and loudness.
b: open circles are used for the brush handle

midi pedals:
1) section pedal changes the presets used in the wacom instrument
2) a midi expression pedal is used to jump the cymbal sound between transducers in the first sections, and later between hand-held speakers.

graphic notation:
for some techniques in the piece, graphic notation is used to visually describe the resulting sound. in general, the vertical position of a shape refers to the relative pitch of the sound, while the vertical width and darkness of the shape indicates the relative loudness of the sound. the internal variations of each shape indicate that a change in quality should be apparent, for instance this might possibly achieved by changing the resonance of the drum head, the amount of pressure used, or speed of motion.




while bowing the muted cymbal, move expression pedal to jump between transducers in the piano. in the second part of the piece, the sound jumps between hand-held speakers on stage.

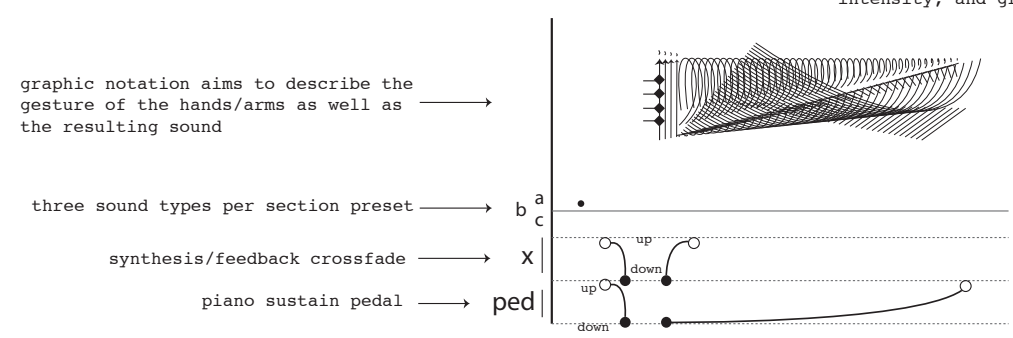


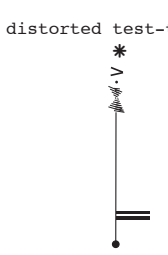
press two rocks against each other with varying degrees of speed and pressure, using the graphic notation as a general guide for relative pitch and intensity.

# wacom/transducer/piano instrument

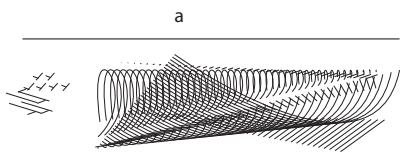
on top of the piano sits a multi-touch wacom tablet fitted with a tactile surface in a simplar pattern to a two manual keyboard. the finger motions are sent into a computer running max/msp used as an impulse sound source for signals sent from the computer through four tranducers sitting on the strings of the piano. see also the technical layout desrciption for more indepth layout. the wacom part is the central electronics source in the piece.

graphic notation is used in the wacom/piano part to visually describe the resulting sound as well as the gesture of the fingers, hands and arms on the tablet surface. in general, lines which are more vertical in orientation are used for more dry staccato like textures, while sounds that have more continuty (e.g. longer FM sounds) have more of a horizontal orientation. the approximate vertical center of a shape indicates a relative pitch, and the relative height/size of a shape indicates its intensity, and granular density.

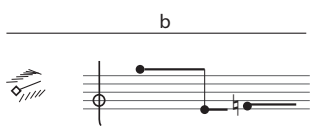



basic sound types:

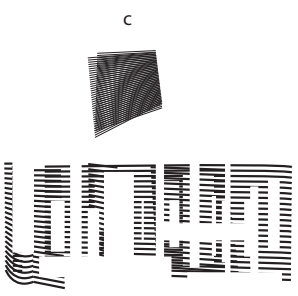



dry, percussive granular sounds

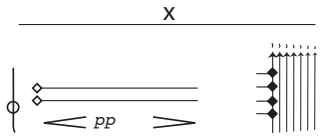



pitched, or semi pitched granular sounds.

for notated pitches, keyboard range is from C below middle C, to C above the staff.

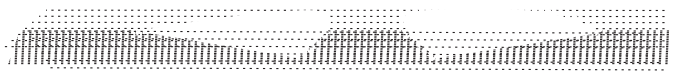



highly modulated, more continuous FM sounds




extreme feedback pitches to the point that the transducers jump up and down on the strings

recording of a large group of people talking filtered with wacom interface and played into transducers into the piano



# strings

equal temperament (ET)

±14 cents from ET)

±31 cents from ET

±50 cents from ET

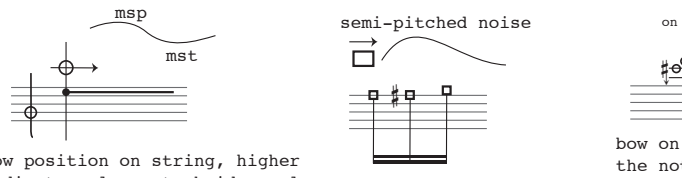
light to normal bow pressure

heavy bow pressure

mute

amplification:
all strings should have DPA mics attached --
amplified sound should be balanced and clean, mixed with the rest of the ensemble

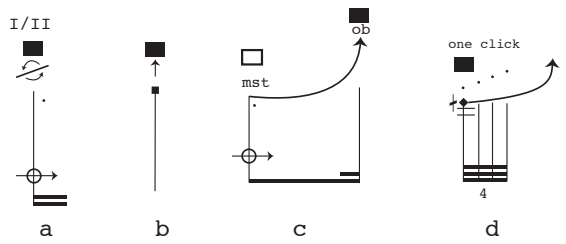
light pressure




bow position on string, higher indicates closer to bridge, closer to note means more sul tasto

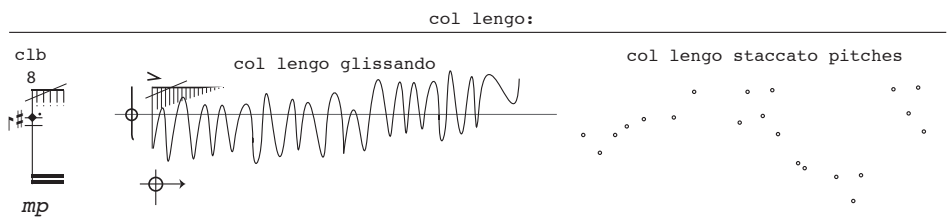
bow on the edge of where the note begins to emerge

pressed bow gestures:

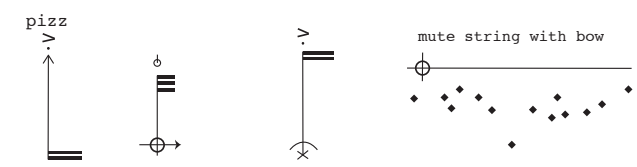



a: press bow wood into hairs into string and twist, creating a granular pitched sound
b: drag bow vertically on string with strong pressure
c: semi-circular bowing, from light horizontal molto sul tasto bowing, to pressed vertical bowing up to the bridge (ob = on bridge)
d: heavy pressure and slow bowing that produces one pitched click at a time.

col lengo:

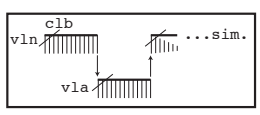



finger sounds:




string fingers on string as loud as possible, so that some pitch is audible between finger and nut.

violin & viola:




interlocking col lengo jete, between violin and viola to create a semi continuous texture

violoncello:

a: “extended gravity jete”, where bow bounces for a very long time, using the weight of the bow to keep it bouncing. speed and bow position are indicated graphically.
b: “one hair” from the bow is pressed into the string and dragged vertically, creating little pitched clicks as it chafes against the grains in the string.

# handheld speakers

at a climatic moment in the piece, the winds put down their instruments and stand holding hand held speakers. at first the sound coming out of the speakers is a mezzoforte white noise. as the performers slowly move the speakers through the air we hear soft aliasing and cancellation effects. there is a short interruption by the ensemble at rehearsal number 44, and then after another section of white noise, the ensemble enters again -- the white noise is cut and replaced with the amplified sound of the percussion. for a long period of time, only the percussion comes through the handheld speakers until the last section (59-64), where the piano/wacom instrument shifts from the transducers into the speakers, and ends with high sinewaves also in the speakers.

the moments of the speaker performers should be as unified as possible; very smooth, somewhat majestic, yet impersonal, like robots. transitions between poses are notated, where arrows continue between positions, there should be no stop, but a fluid continuation, to the next location.

transposed score

# flint

rama gottfried 2014

♩= ca. 66

1/4 2/4 4/4 4/4 3/4 1/4 10″

picc
pp p sf sfz p pp p sf p pp

ob
5

cl (Bb)
5
pp pp sempre

s sax (Bb)
sfz sfz sfz
PA: *mp*

plant pot base, w/ nail
perc
7

pno
b a c
x
ped

vln
I/II
sf sffz mf sffz sf sf sffz
pizz clb 8

vla
I/II
sf sffz mf sffz f sffz
pizz clb 8

vc
I
pp pp
(I) (I)

1

10″

1
4

mp

p

plant pot base, w/ fingertips

ppp

transducer pan pedal

1
2
3
4

pp

mp

... sim.

b a
c

x

ped

... sim.

10″

1
4

2

1/4 4/4 3/4 2/4 1/4 1/4

sfz sfz mp sf pp sfz pp sfz pp

5

duo duo

b a c
x
ped

clb pizz I/II IV

p sffz p sfz p sf sffz

ppp sempre

3

1/4 5/4 4/4 1/4 10″

mp sf pp mp pp

3 5

sfz

3 5

b a c

X

ped

1/4 5/4 4/4 1/4 10″

pizz I II sffz

I/II sf

clb 8 p

I/II sf

clb 8 p

I/II sf

pizz sffz

3 5

4

10″

1
4

mp

p

ppp

plant pot base, w/ fingertips

transducer pan pedal

1
2
3
4

pp

mp

... sim.

sfffz

pp

b a
c

x

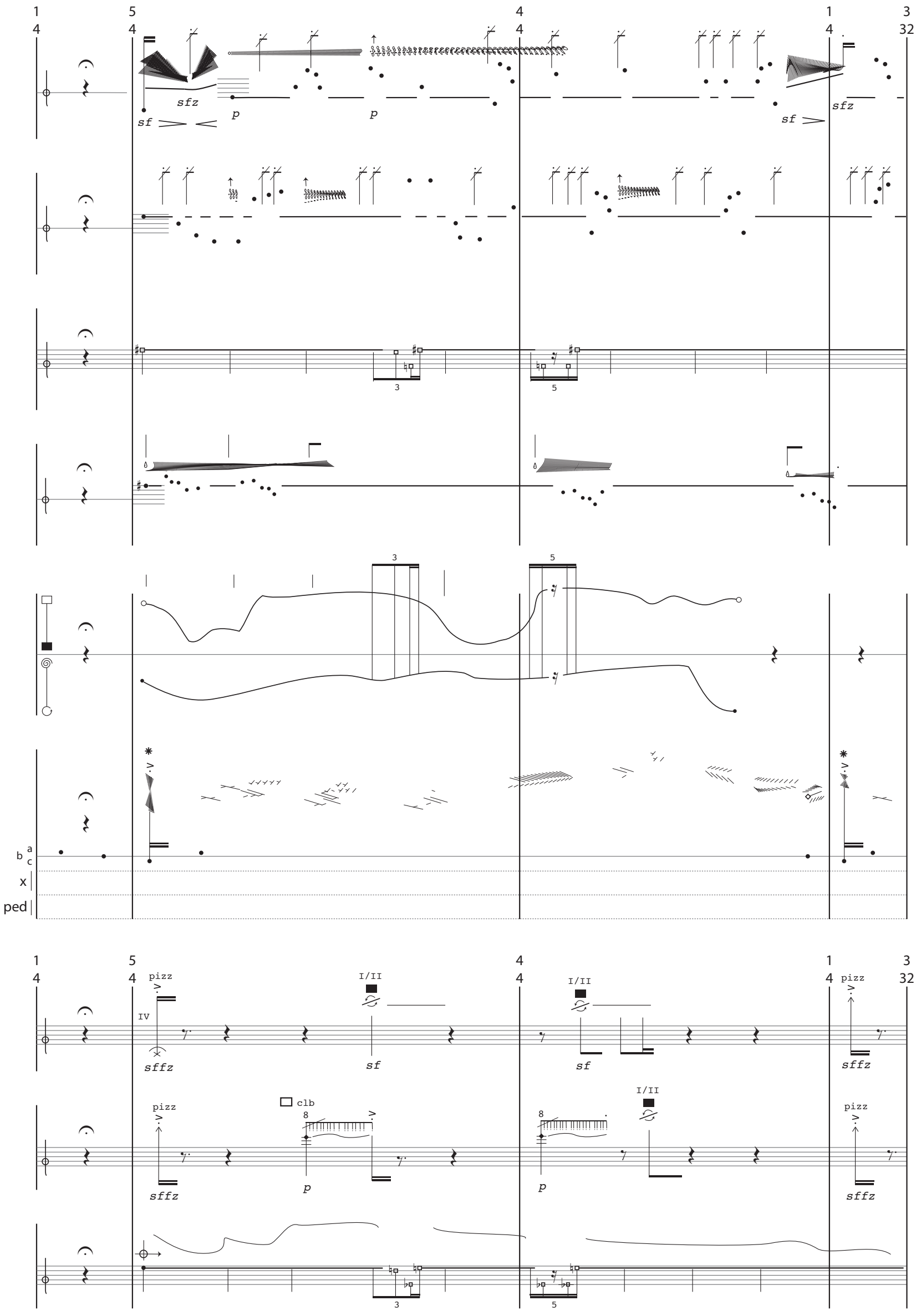
ped

... sim.

10″

1
4

5


1 4
5 4
4 4
1 4
3 32
sfz
sf
p
p
sfz
sf
3
5
3
5
b a c
X
ped
pizz
I/II
IV
sffz
sf
clb
8
p
I/II
pizz
sffz
I/II
sf
pizz
sffz
pizz
sffz
8
p
pizz
sffz
3
5

6

15″

sfz p sfz sfpp

ppp ppp

"fff" sfp sfz "fff" sfpp

4 blend with cello 4

pp sempre

1

b a c

x

ped

15″

pizz pizz

mute string with bow mute string with bow

ob ob ob

mst mst mst

3

sfz sfp "fff" sfz sfz sfz

sfz sfp "fff" sfz sfz sfz

(p)

7

15″

10″

mp

b a
c

x

ped

15″

10″

clb
vln
...sim.
vla

(sul pont trem)

8va

15 8va

clb
vln
...sim.
vla

8va

15 8va

8

10″

3–4″

*fff*

3
32

3–4″

3–4″

*sff*

mp

f

3–4″

*sfz*

3–4″

2 rocks, crushed against each other

2 solo

3–4″

*fff*

b a c

X

ped

10″

3–4″

pizz

*sffz*

3–4″

pizz

*sffz*

3–4″

pizz

*sffz*

9

3/32 5/8 5/32 6/8 3/32 7/8 5/32 10″

3 ~3~

*fff* *p* *p* *f sempre* *p* *p*

finger tip crush

b a c x ped

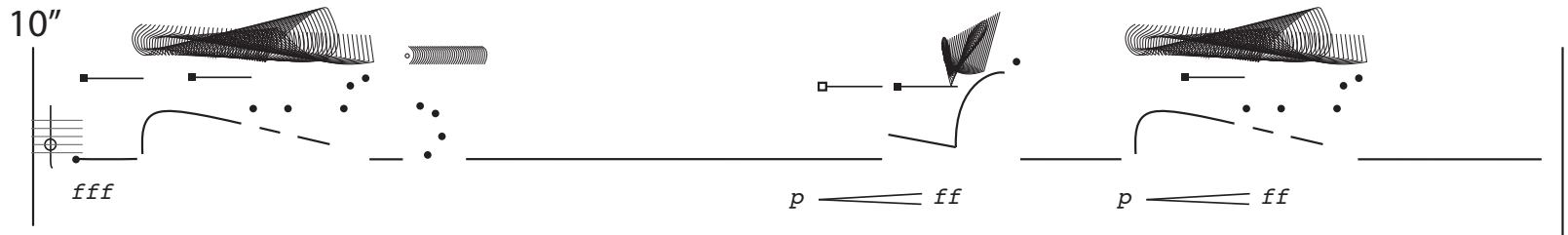
3/32 5/8 5/32 6/8 3/32 7/8 5/32 10″

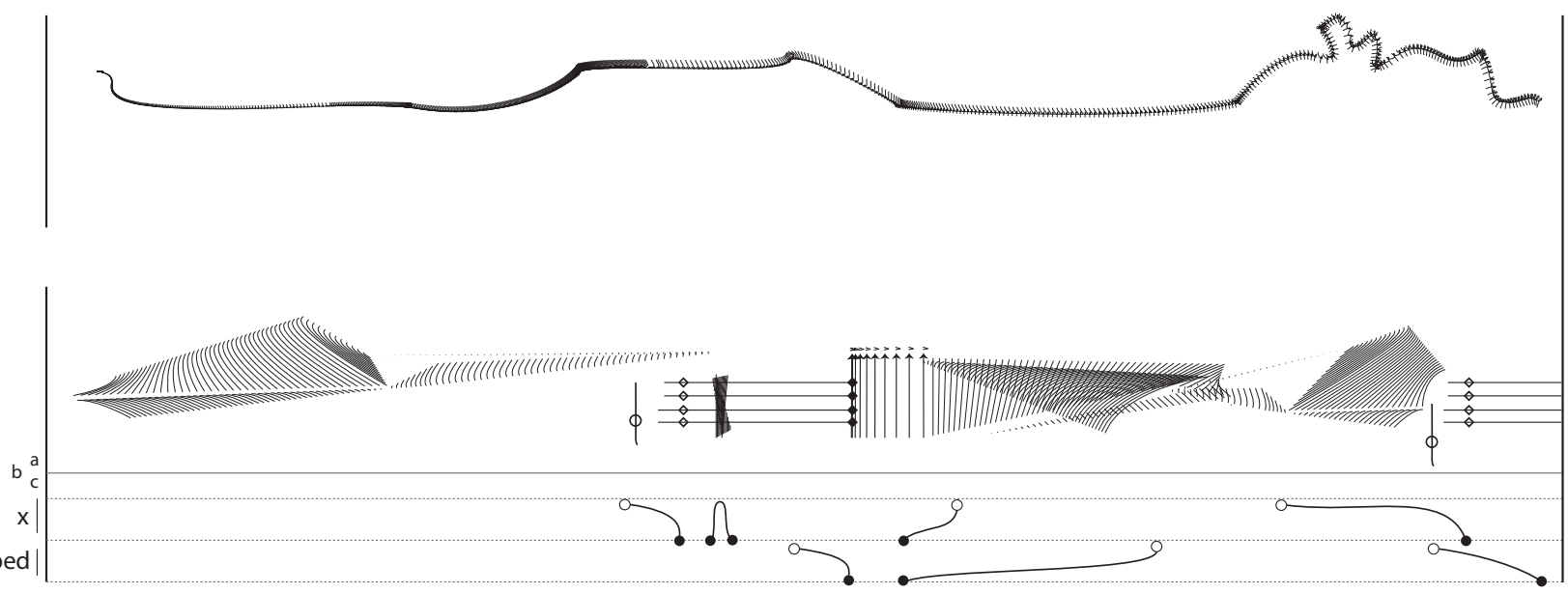
jeté ob mst

*p* *mf* *p* *mf* *sim.* *sfz*

10

10″






10″

11

3
32

p ff p ff fff

fff

b a c
x
ped

3
32

12

3/32 7/8 5/32 8/8 5/32 2/8 7/32 10″

fff

p

f sempre

p mf p mf p

b a c
x
ped

3/32 7/8 5/32 8/8 5/32 2/8 7/32 10″

ob mst sfz

p mf

13

10″

p ff

p ff

fff

sff

sfz

b a c

x

ped

10″

pizz

sffz

pizz

sffz

pizz

sffz

14

10″

1
4

pp

mp

p

ppp

plant pot base, w/ fingertips

transducer pan pedal

1
2
3
4

3

pp

mp

... sim.

b a
c

x

ped

... sim.

10″

1
4

15

very slow ⟶ a tempo

1/4 4/4 3/4 2/4 1/4 3/32

duo

duo

b a c

X

ped

clb

pizz

I/II

p sffz p sfz p sffz IV sffz

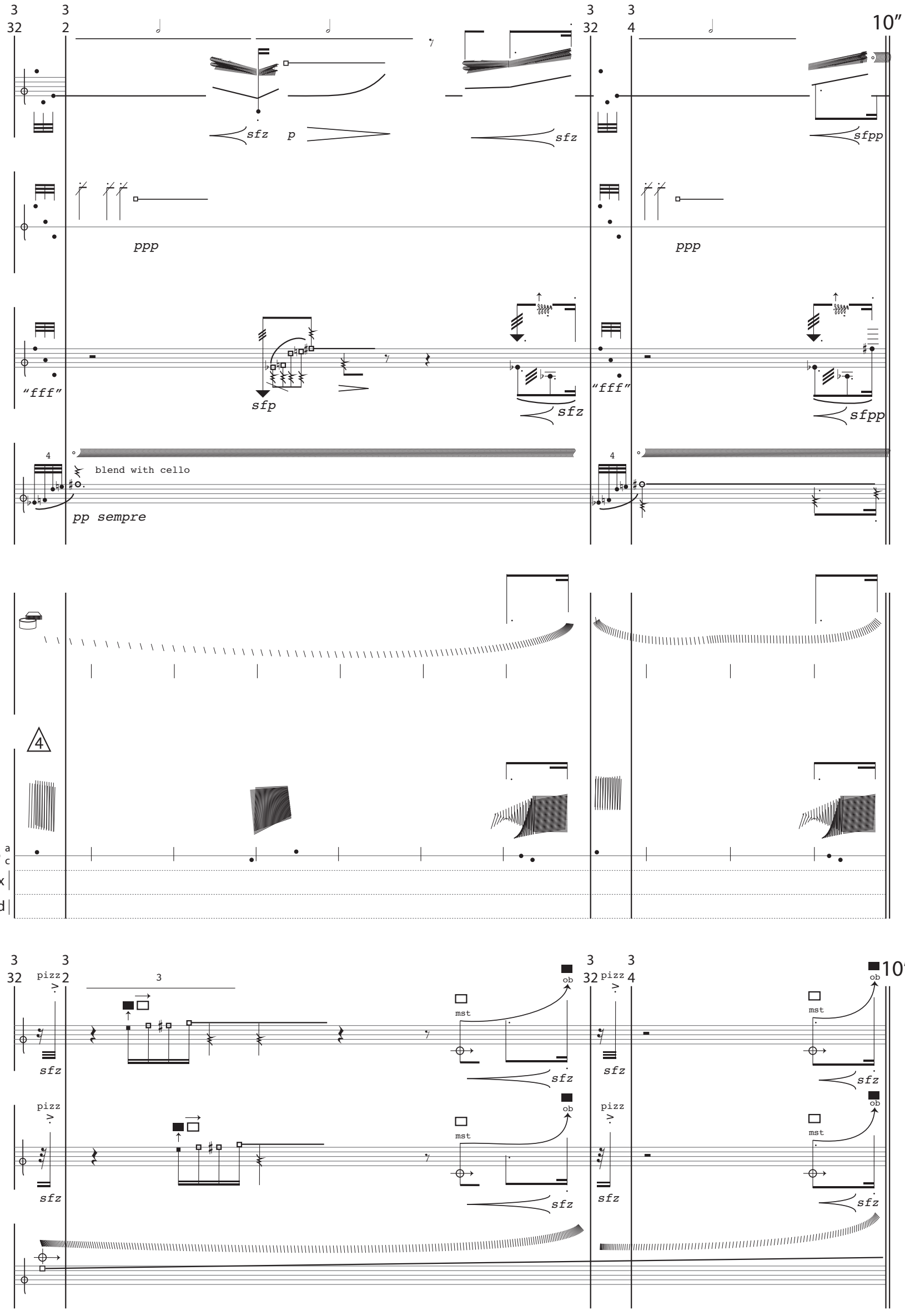
clb

pizz

p sffz sf sffz sffz IV sffz

ppp sempre

16


3 3
32 2
3 3
32 4
10″
sfz
p
sfz
sfpp
ppp
ppp
"fff"
sfp
sfz
"fff"
sfpp
4
blend with cello
pp sempre
4
4
b a
c
x
ped
pizz
3
ob
mst
sfz
17

10″

*PP*

*P*

b a c

x

ped

10″

clb IV

8va

I

clb

vln

vla

...sim.

*P*

clb IV

8va

I

clb

vln

vla

...sim.

*P*

18

10″

*PP*

*PP*

*sfz*

b a c

x

ped

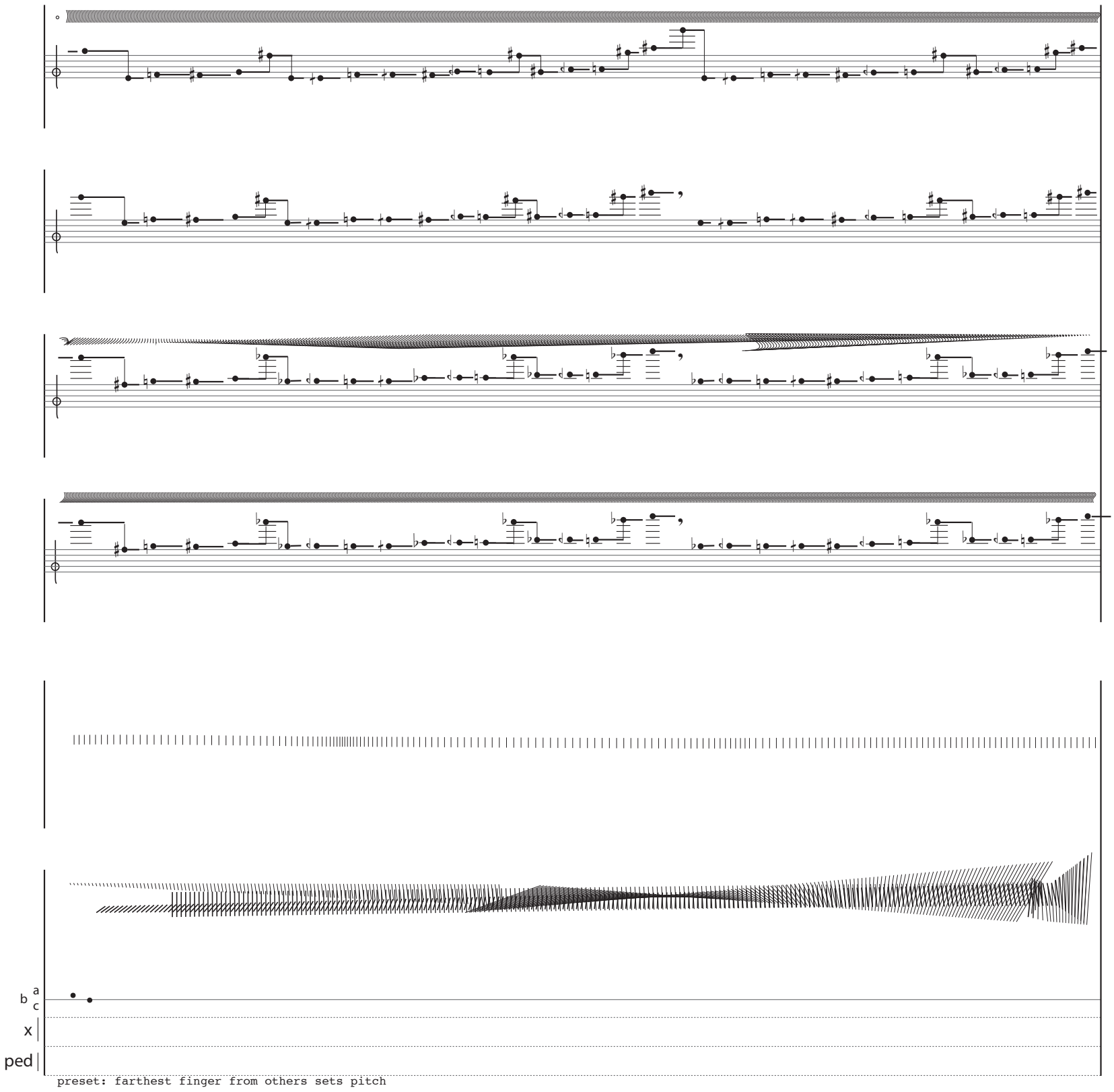
10″

8va

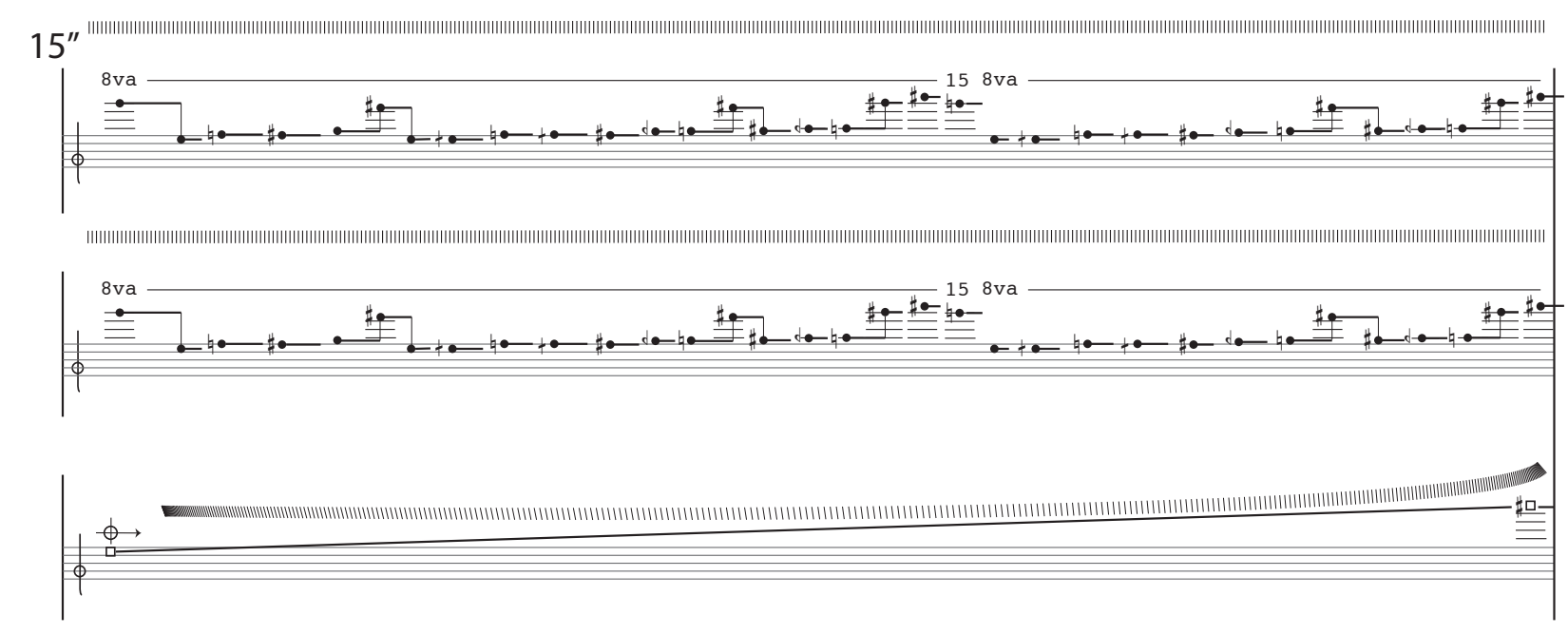
8va

19

15″


b a
c
x
ped
preset: farthest finger from others sets pitch

15″


8va
15 8va
8va
15 8va

20

10″

3
32

*pp*

*pp*

solo

*pp*

b a
c

x

ped

10″

3
32

8

*pp*

8

*pp*

*pp*

21

3 3
32 4

sfz

ppp

4

"fff"

sfz

4

(pp)

3 3
32 2

sfz p

sfpp

ppp

"fff"

sfp

sfz

10″

b a
c

x

ped

3 3
32 4

ob

mst

sfz

3

ob

mst

sfz

3 3
32 2

"fff"

ob

mst

sfz

3

"fff"

3

ob

mst

sfz

10″

22

10″ 3–4″ fff

3–4″

3–4″ sff mp f

3–4″ sfz

3–4″ 2 rocks, crushed against each other

solo 3–4″ fff

b a c

X

ped

3 32

10″ 3–4″ pizz sffz

3–4″ pizz sffz

3–4″ pizz sffz

23

3/32 5/8 5/32 6/8 3/32 7/8 5/32 2/8

3

~3~

*fff*

*p* *p*

*f sempre*

*p* *p*

finger tip

crush

b a c

x

ped

*p* *mf* *p* *mf* *sim.* ob mst *sfz*

jeté

24

2/8 7/32 8/8 5/32 7/8 3/32 6/8

fff

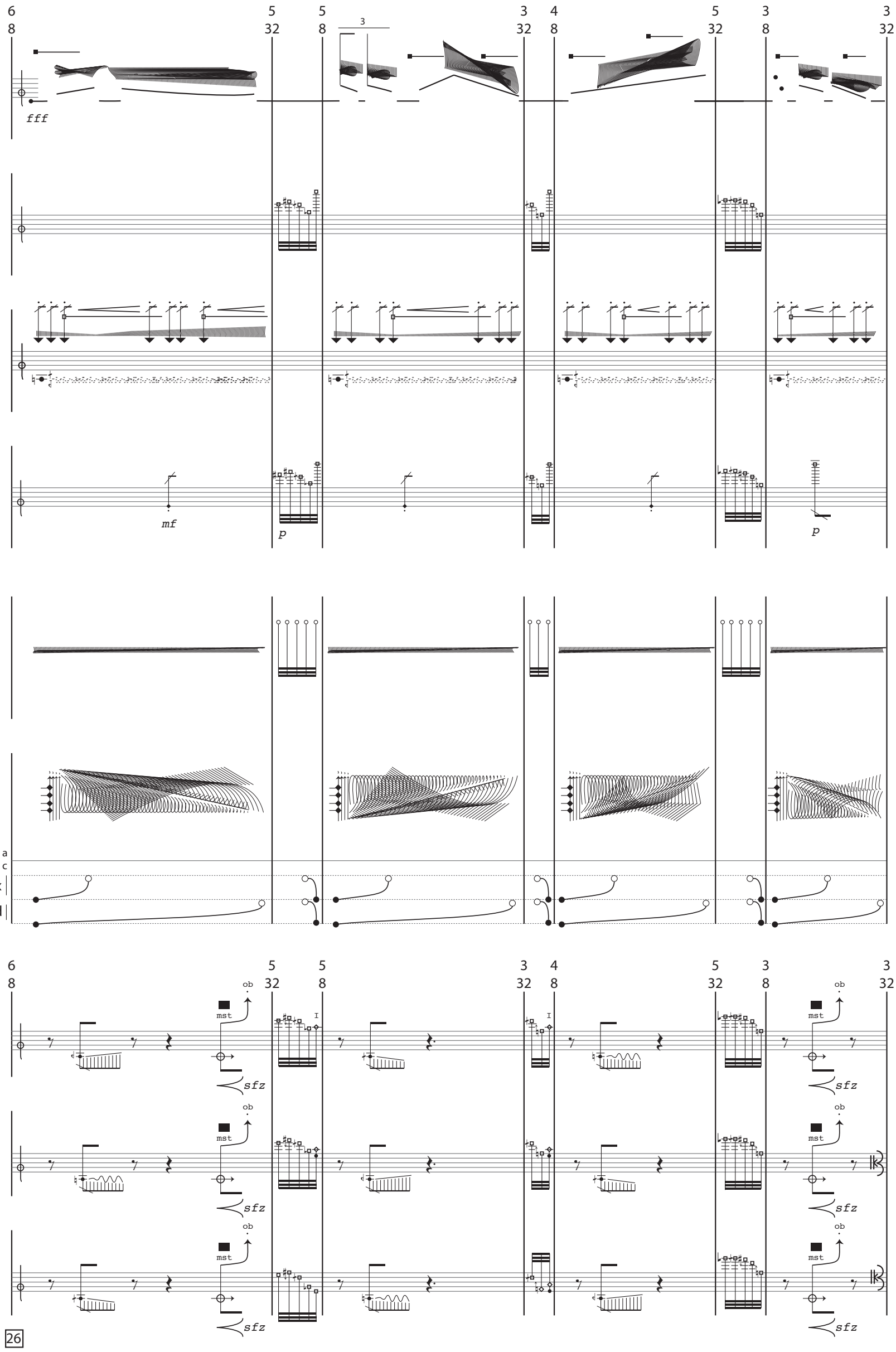
p p mf p mf p

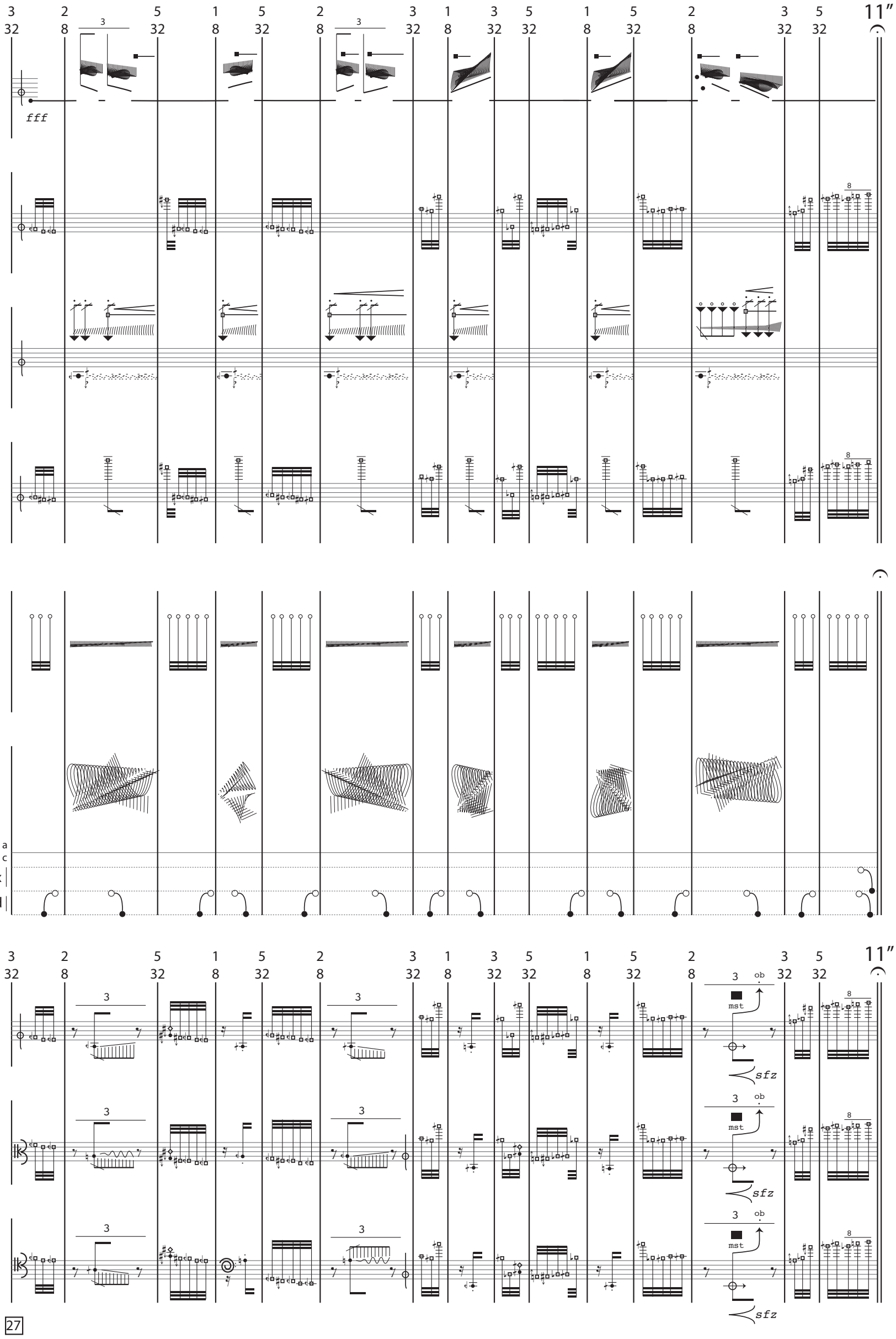
b a c
x
ped

2/8 7/32 8/8 5/32 7/8 3/32 6/8

ob mst sfz

25


6/8
5/32
5/8
3/32
4/8
5/32
3/8
3/32
fff
3
mf
p
p
b
a
c
x
ped
ob
mst
I
sfz
26




27

11″

3
32

p ff p ff fff p

sff

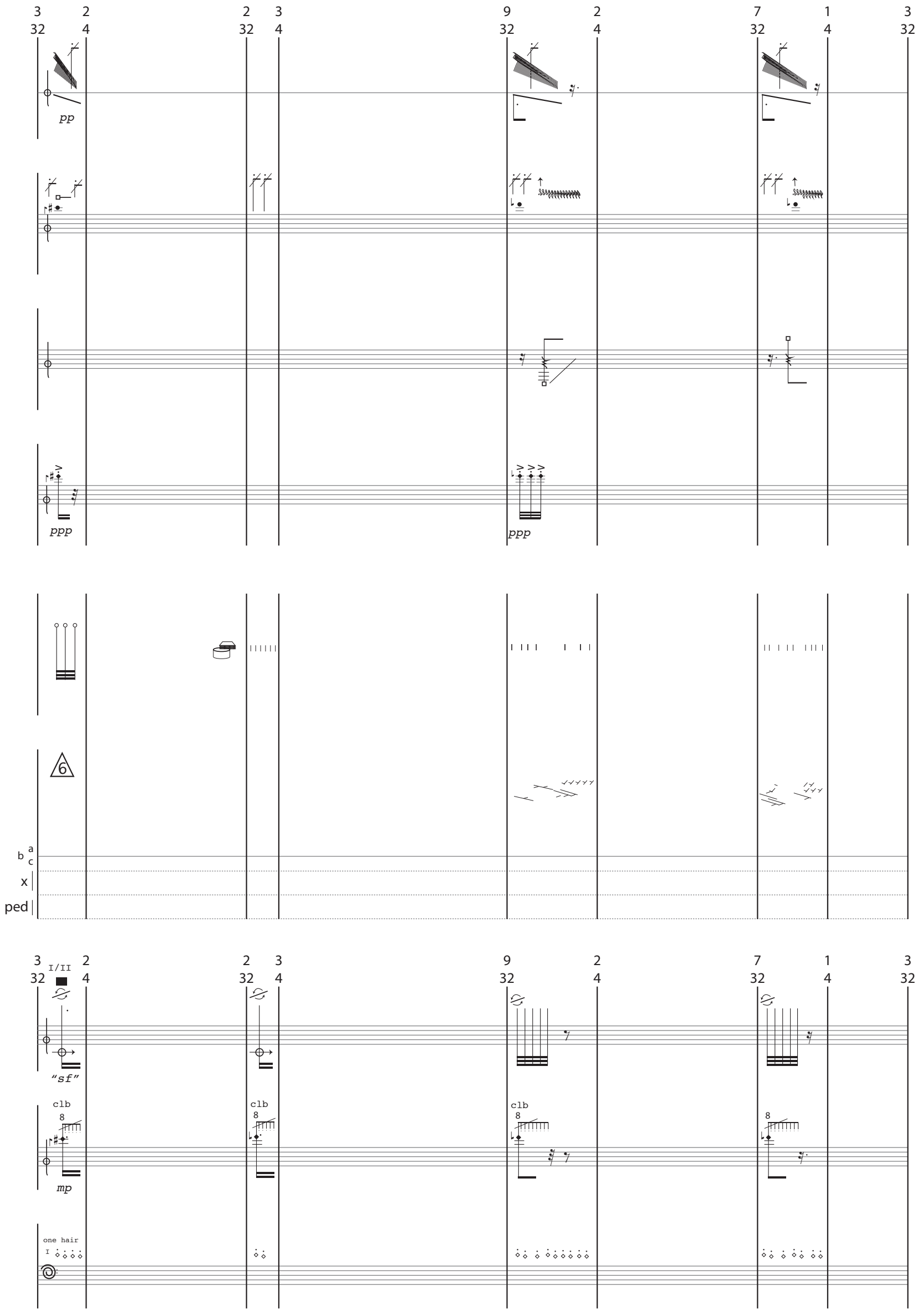
1.v.

b a
c
x
ped

11″

3
32

28


3 2
32 4
2 3
32 4
9 2
32 4
7 1 3
32 4 32
pp
ppp
ppp
6
b a
c
x
ped
I/II
"sf"
clb
8
mp
one hair
I
clb
8
clb
8
8

29

3/32 6/8 2/2 3/32 4/8 2/8

pp

ppp

3

pp ppp

ppp ppp

l.v. l.v.

b a c

x

ped

one click ob

one click ob

4

3

p ppp

30

highest note

wt

< f > sfz

sfz

p

ppp

highest note

3

< f > sfz

p

pp

teeth on reed

< f > sfz

teeth on reed

< f > sfz

< sfpp sfpp 3 sim.

sffz

3

with smooth edge

l.v.

b a c

x

ped

pizz

IV

I

I/II

sffz sffz

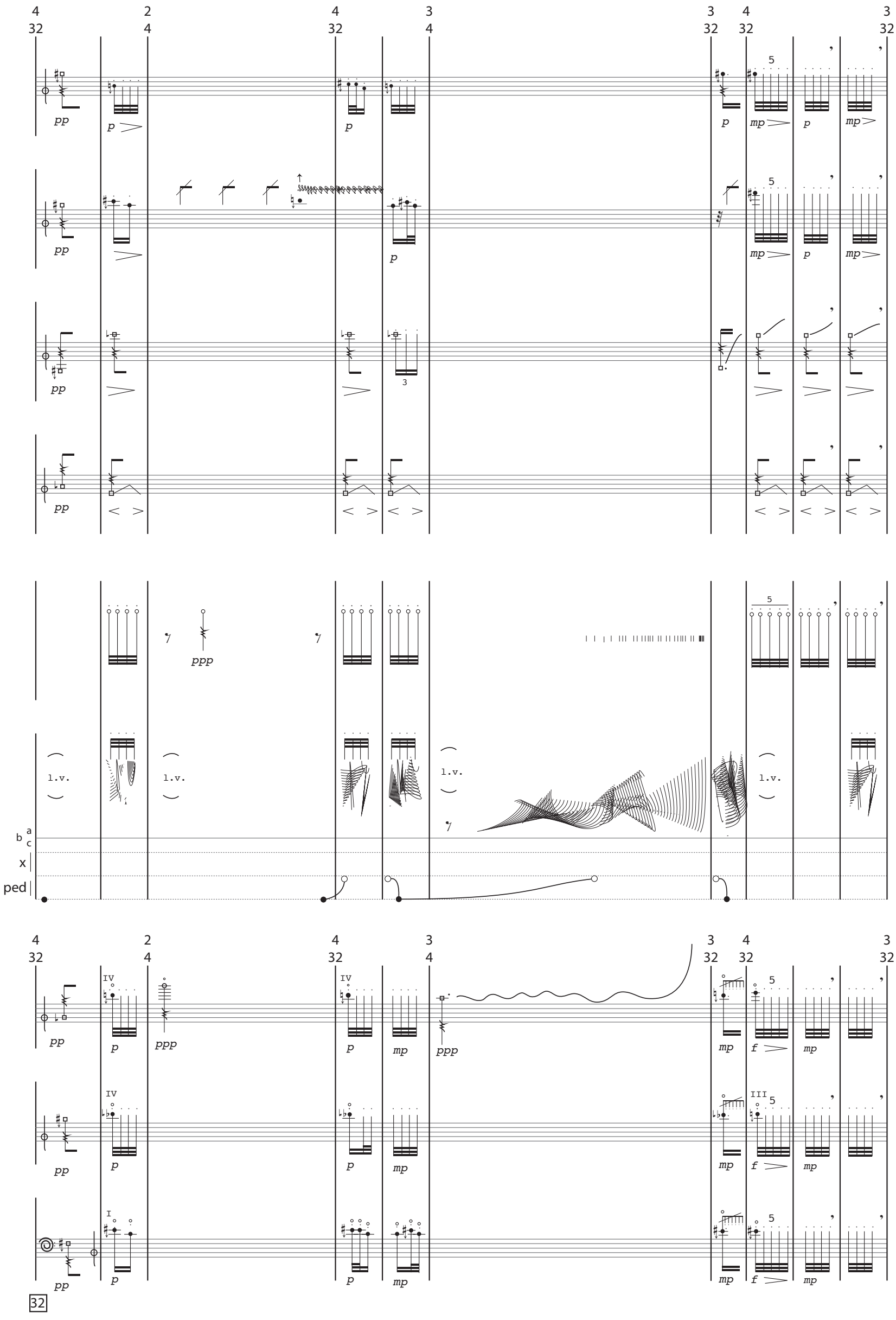
f

3

sf

pp

31


4/32
2/4
4/32
3/4
3/32
4/32
3/32
pp
p
mp
ppp
l.v.
5
3
IV
III
I
b
a
c
x
ped

3 3 3 2 3
32 2 32 2 32

ppp

air tone, with slight pitch

p

as before

p

3

ppp

subito

ppp

l.v.

l.v.

b a
c

X

ped

sff

3

ppp

3

p

on the verge of pitch

III IV

pp

mp

pp

on the verge of pitch

(senza vibr.)

III II

III II

pp

3

p

ppp

33

3 5 5 2 3 10″
32 8 32 8 2

mf mp pp

as before as before

p mp pp mf

p mp pp cresc. mp

ppp ppp mf

l.v. l.v.

piano p

b a
c
x
ped

3 5 5 2 3
32 8 32 8 2

8va

mp 3 mp pp senza a molto vibrato (non harmonic) mf

III senza a molto vibrato (non harmonic)

pp mp pp mf

mp pp (non harmonic) senza a molto vibrato

mp sfpp mf

34

10″

sfff

sfff

fff dim. pp sff

cymbal

p sempre

(brush)

7

b a c

x

ped

10″

from molto to extreme vibrato

sfff mf

from molto to extreme vibrato

sfff mf

from molto to extreme vibrato

sfff mf

35

10″

mp f

mp f

pp

b a c

x

ped

10″

extreme vibr.

jete

I/II

ob

msp

mst

sf

p

jete

sfp

sfz

36

10″

mp f mp f mp f

pp

b a c

x

ped

10″

I/II

sf sf sf sf

jete

sf

I/II

sf

ob msp mst

p

jete

p sfp sf p sfp

I/II

p sfp sfz

sf sf sf sf sf sf

37

10″

6
4

mp f

pp

b a
c

x

ped

10″

I/II

ob msp

mst

sf sf p sfp mp

I/II

jete jete

sf sf sf sf sf sf sf p sfp mp

jete

sf sf sim.

sf p sfp mp

38

6
4

6/4 5/4

mute wind mics

view from audience
(mirror image in parts)

11″

> > > >> > > > > > > >

white noise

put down instrument, and
pick up small speaker

suddenly stand with
handheld speaker

sfp

stop suddenly and freeze

*mf*

*sfff* *dim.* *f*

8

b a c

x

ped

stop suddenly and freeze*

*white noise in speakers on section 8

extreme to molto vibrato

mst

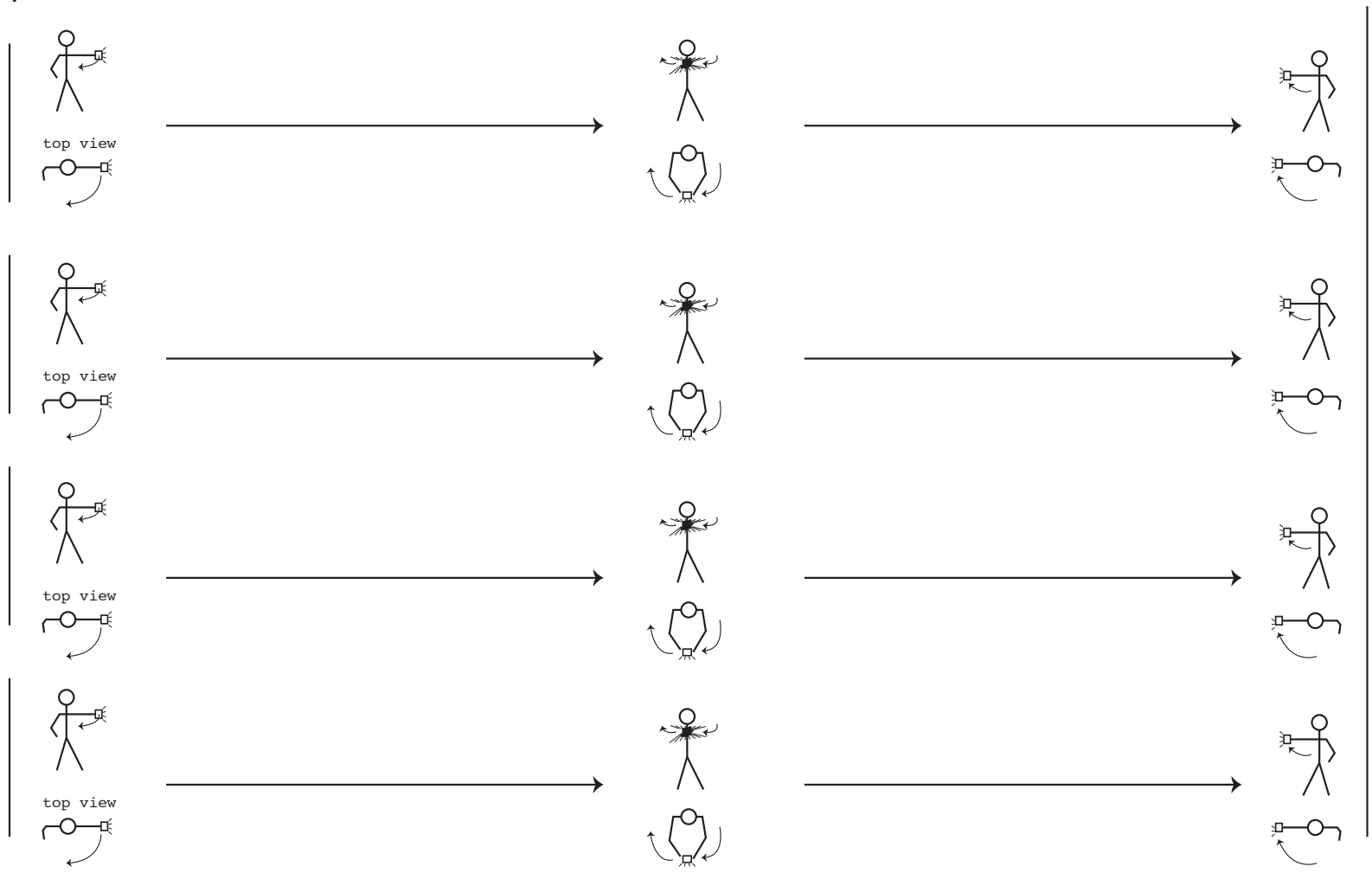
ob

*sfp* *sfz* *sfff* *dim.* *f*

39

white noise in speakers
mute direct signal for piano (keep mics)

11″




conductor and the rest of the ensemble freeze

wacom instrument controls filtered white noise, follow gestures of winds with noise gesture

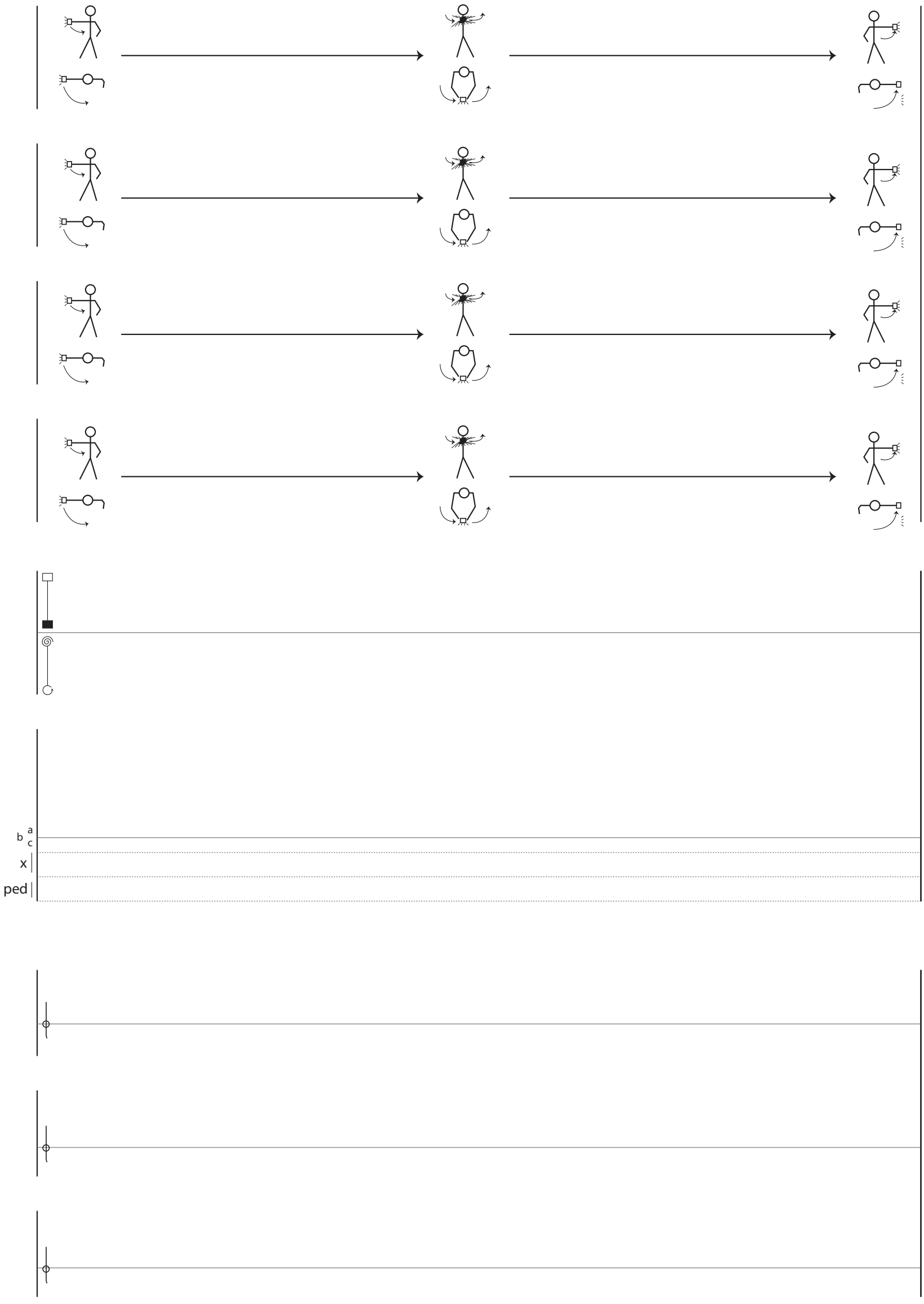
b a c

x

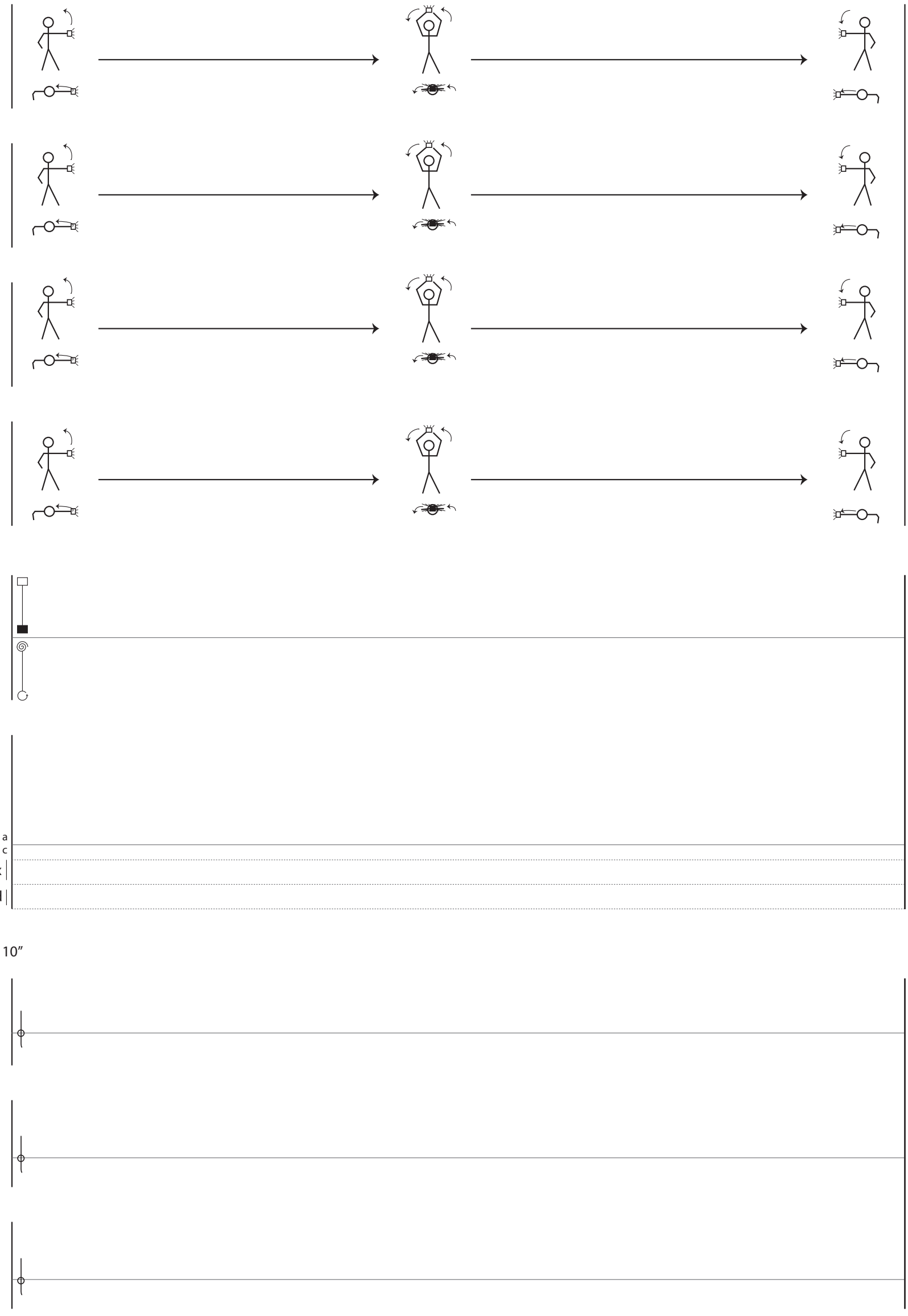
ped

11″

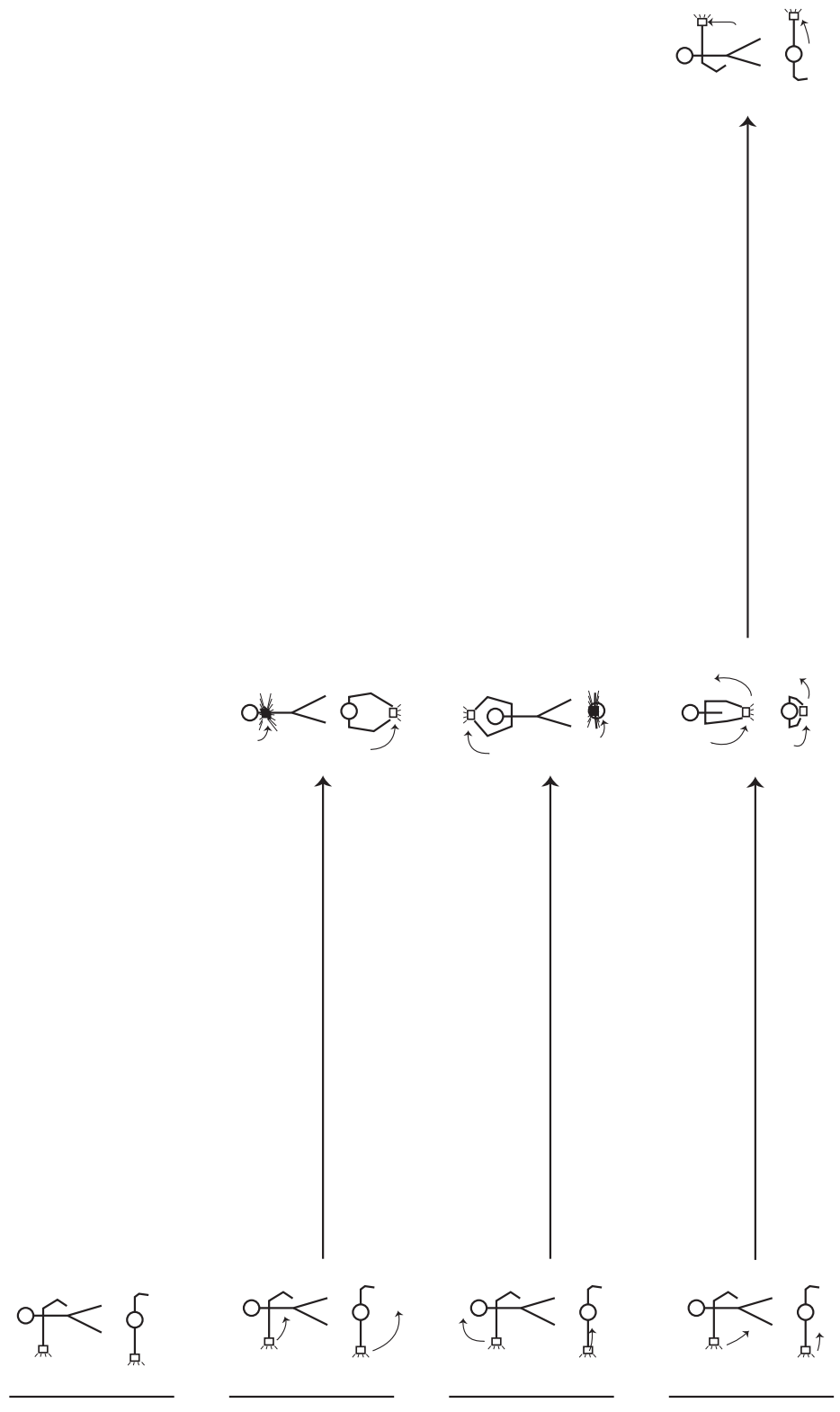
40

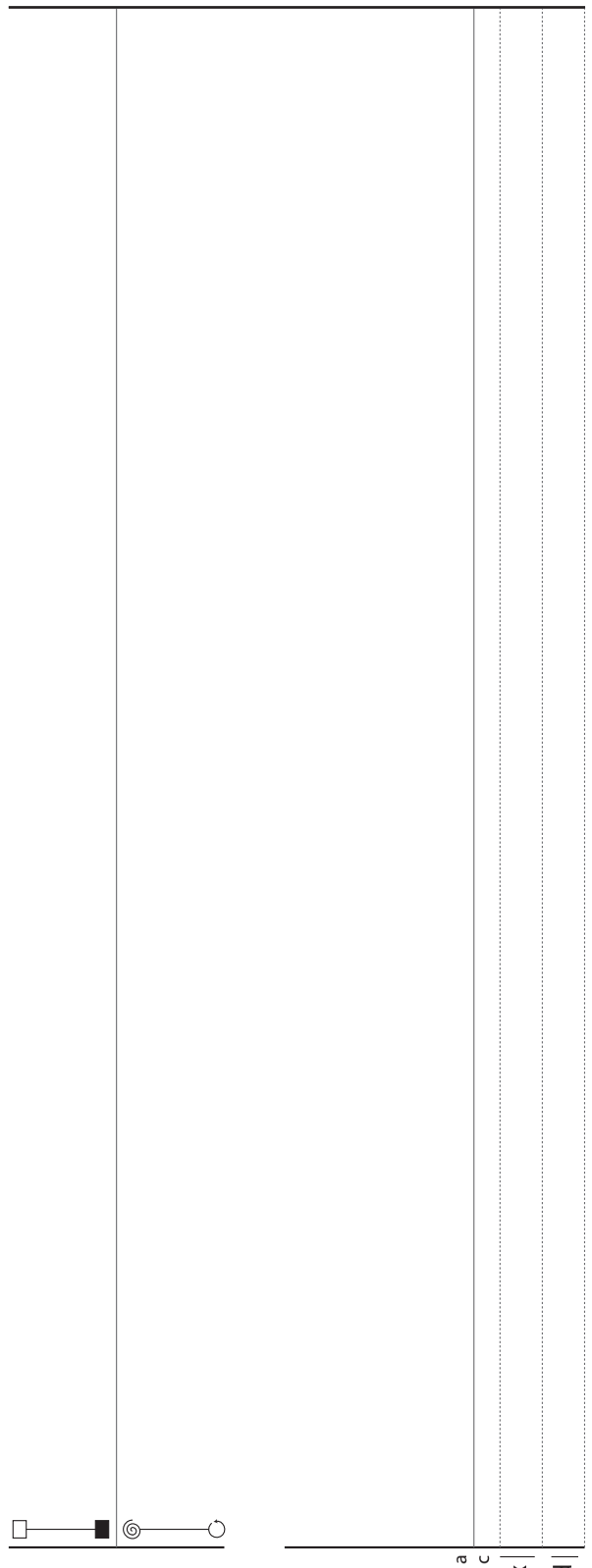


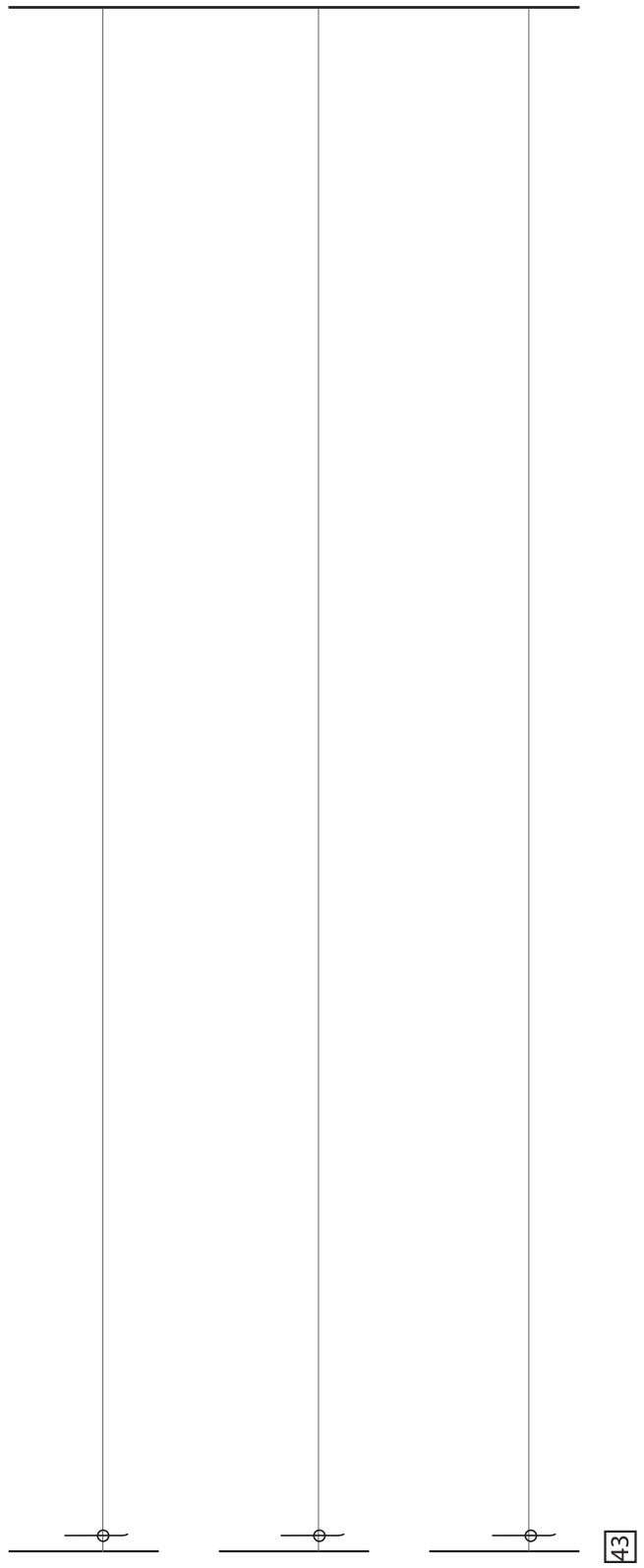

41



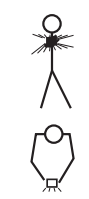

10″




a
b
c
x
ped

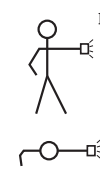

10″
43

percussion in speakers, white noise cut



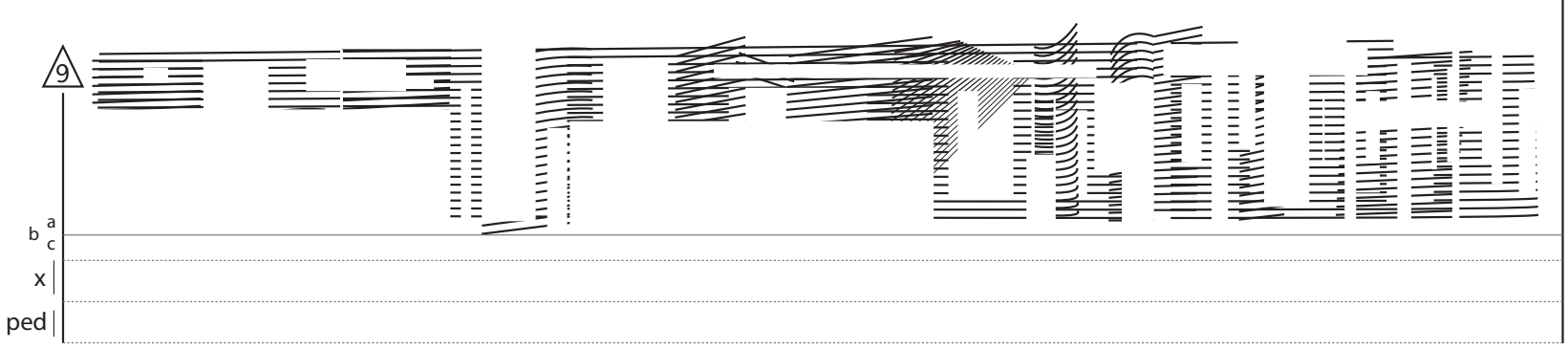
percussion in speakers, white noise cut

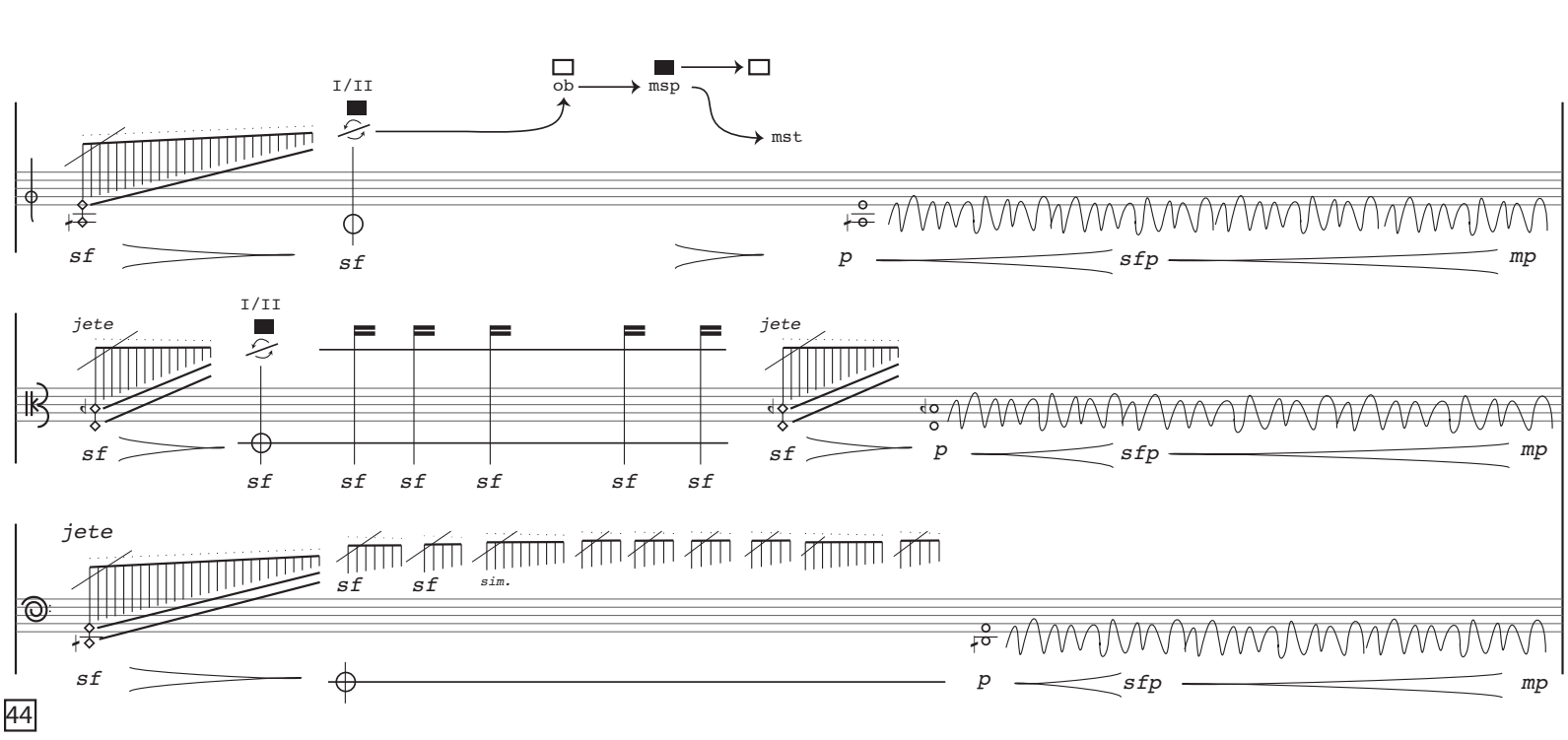
percussion in speakers, white noise cut

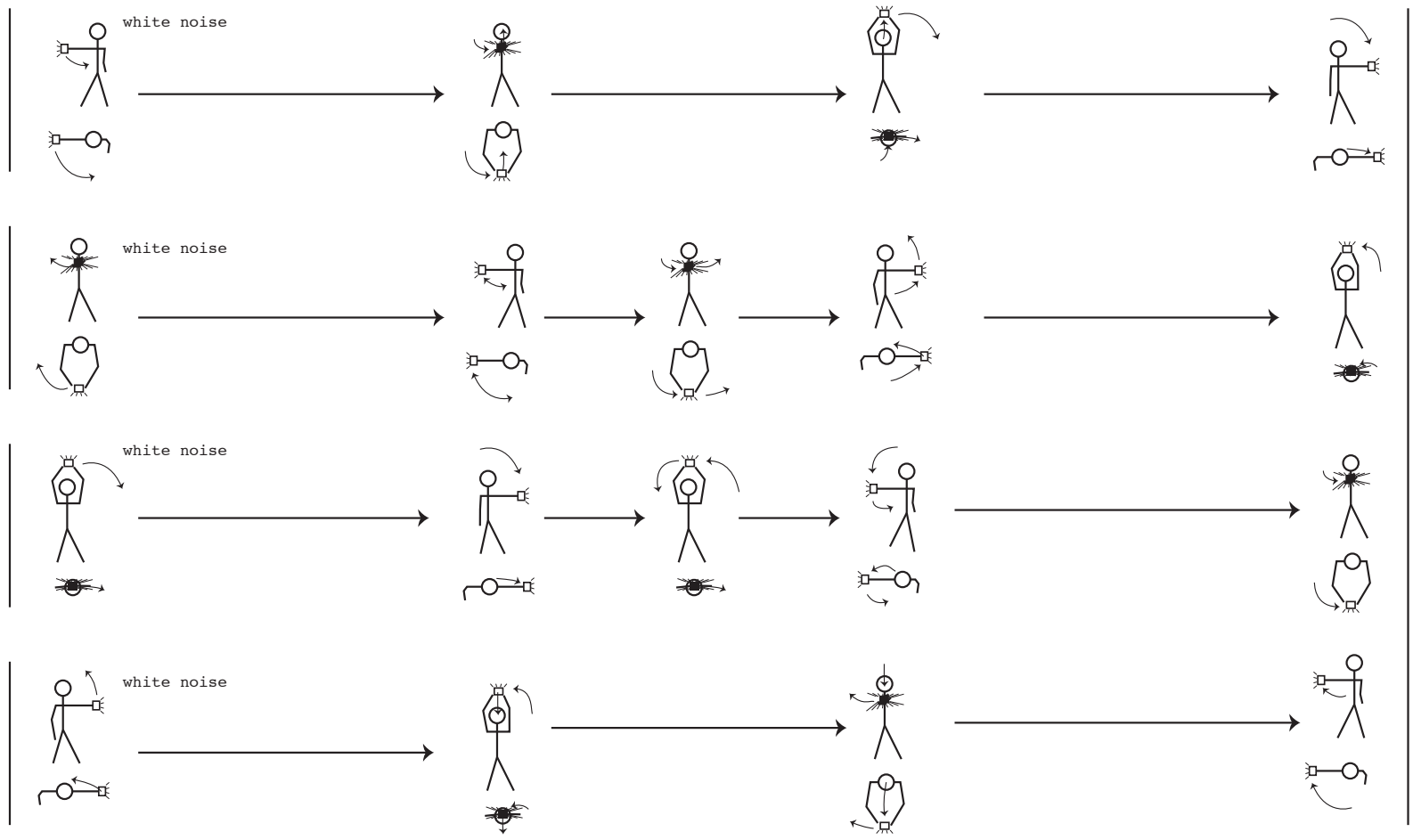


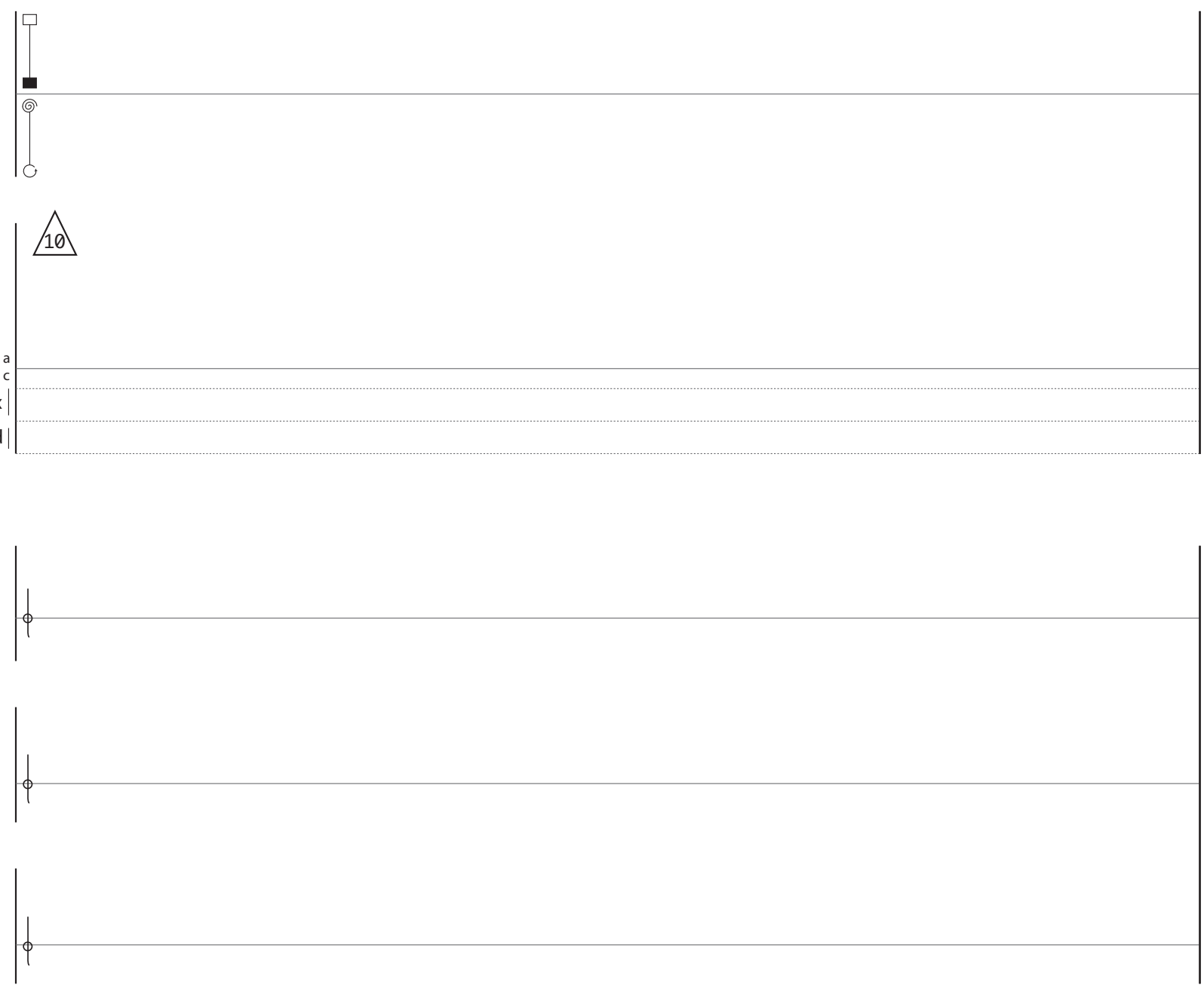
percussion in speakers, white noise cut

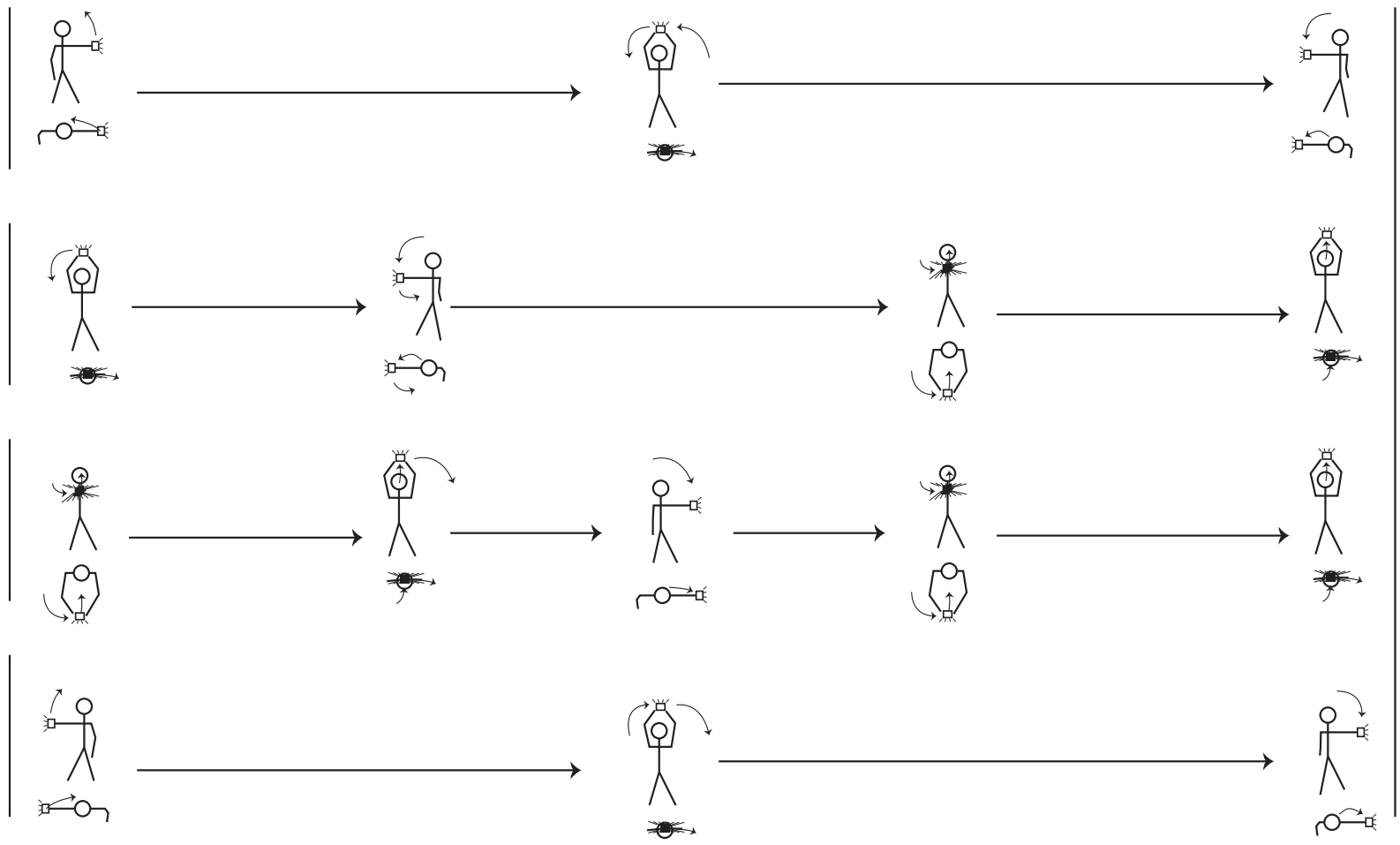
(sound is in handheld speakers)



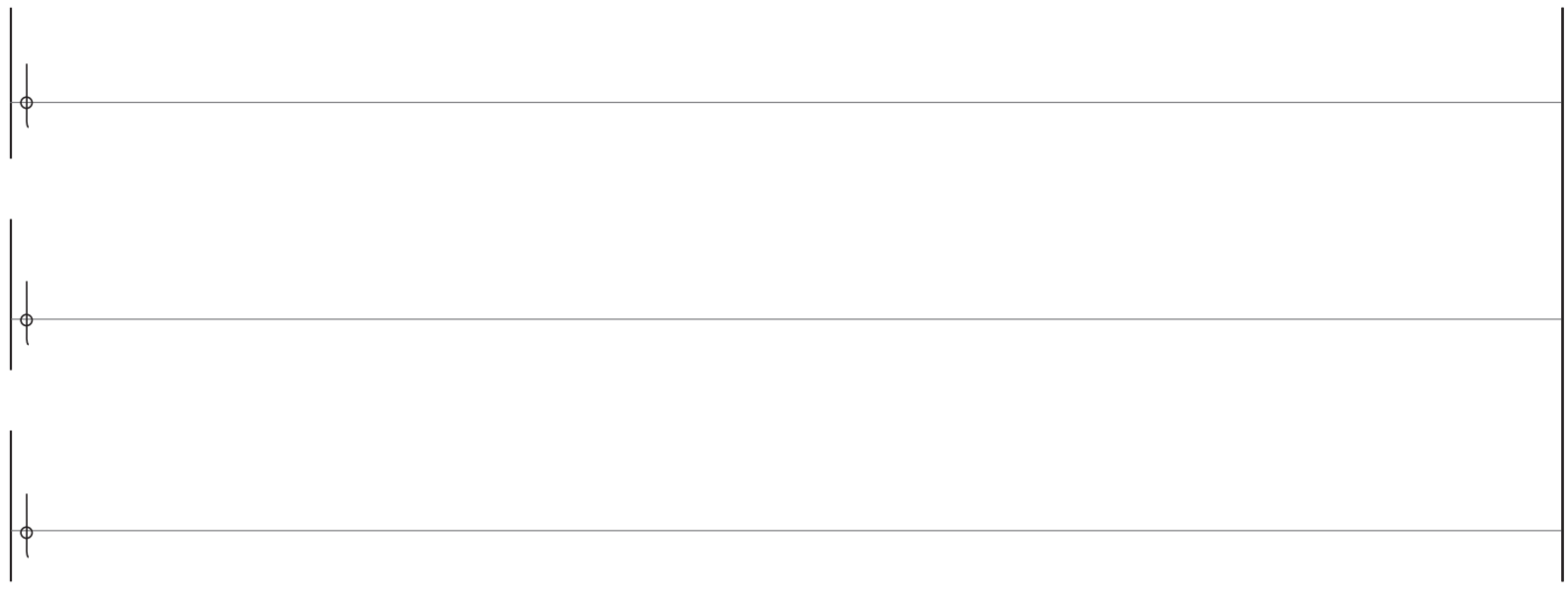




white noise
white noise
white noise
white noise


10
b a
c
x
ped



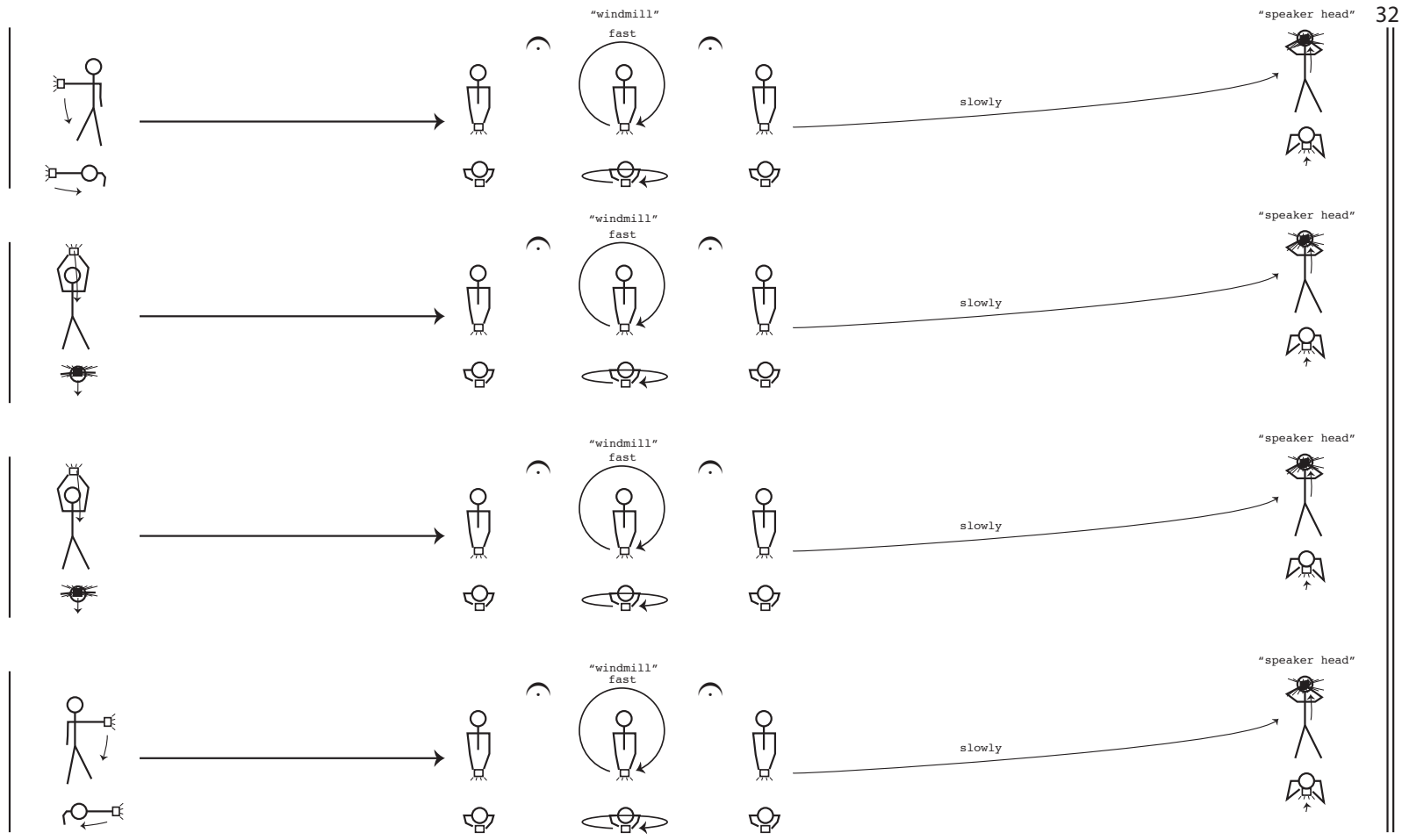
b a
c
x
ped

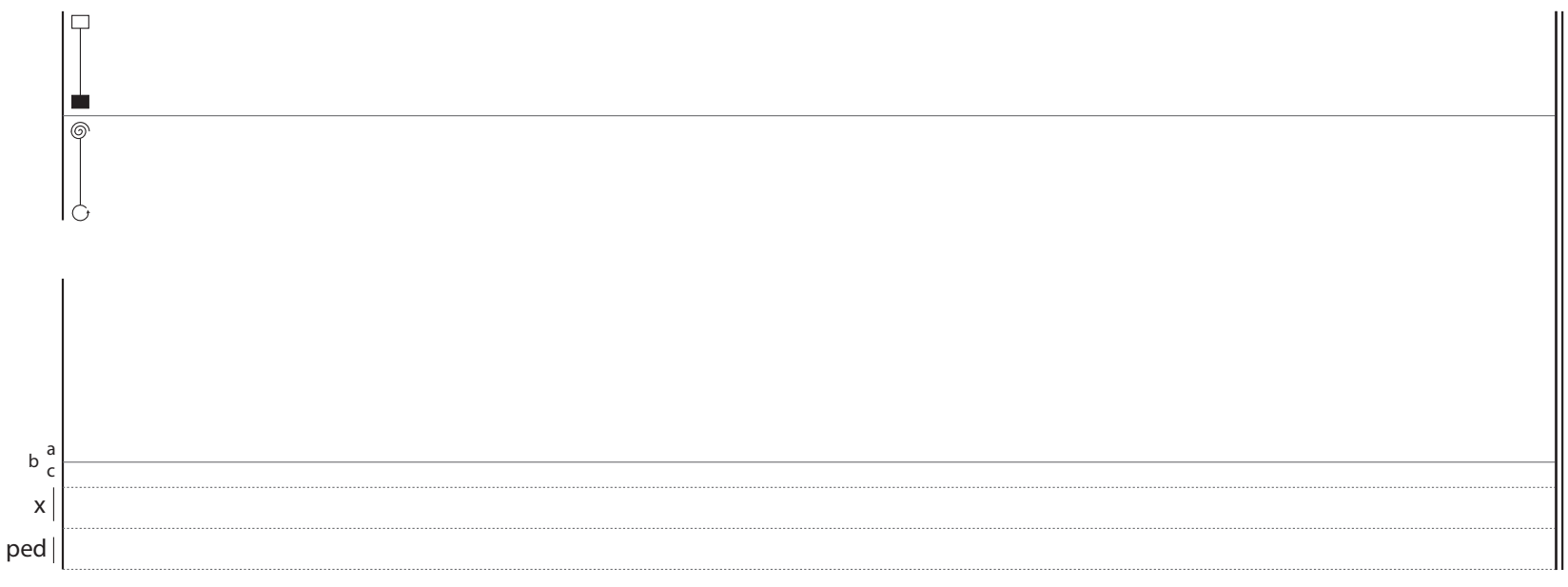


46

cue

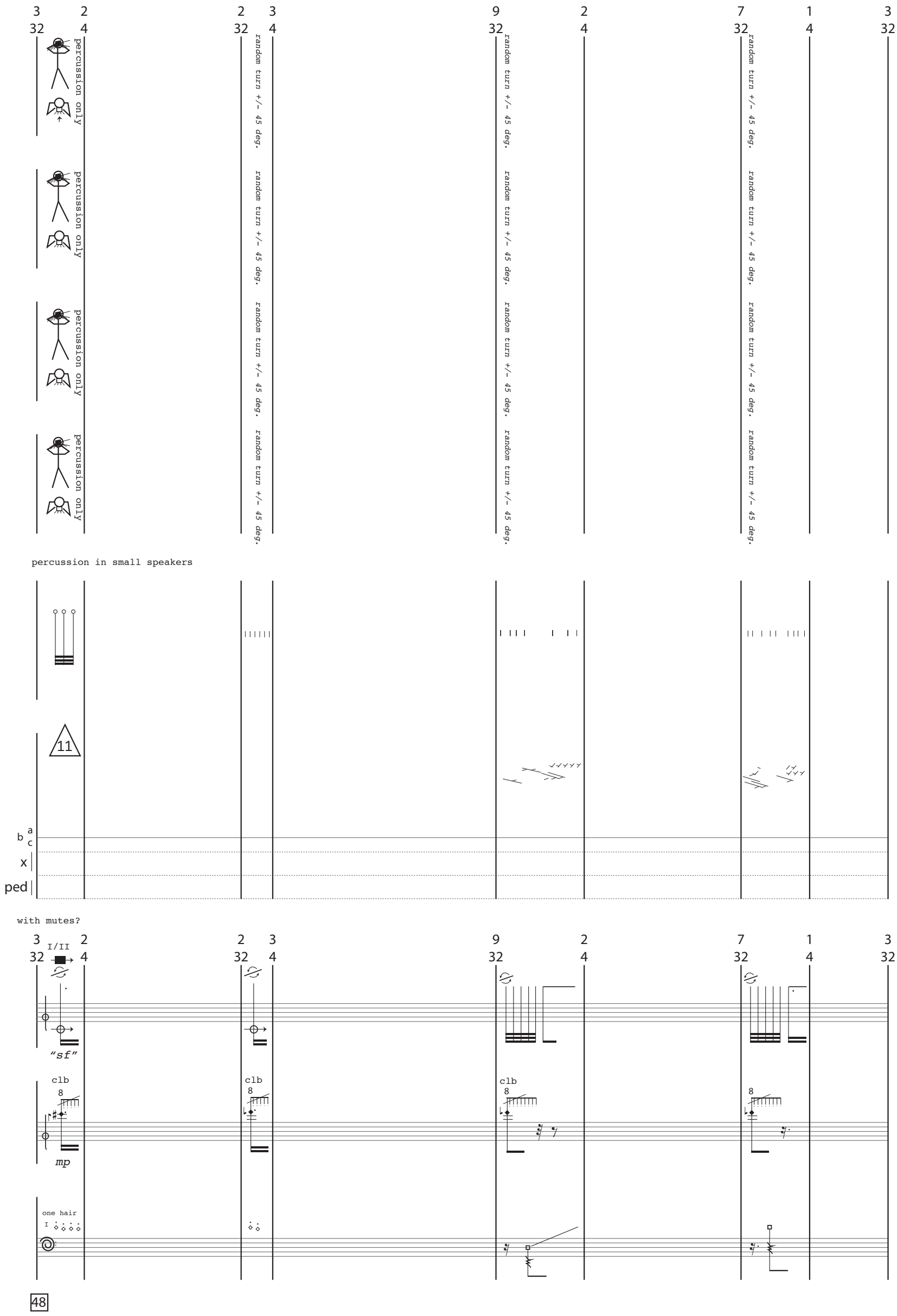
3
32




3
32

47


percussion only
random turn +/- 45 deg.
percussion in small speakers
11
a
b
c
x
ped
with mutes?
I/II
"sf"
clb
mp
one hair
I
48

electronics: resonate from short scurries

3/32 6/8 2/2 3/32 4/8 3/32

l.v. l.v.

b a c
x
ped

3/32 6/8 2/2 3/32 4/8 3/32

one click I ob ob

one click I ob ob

49

ppp p ppp p ppp

3
32

14″

4
32

7″

3
32

speaker pan pedal
1
2
3
4

*p*

... sim.

12

recording of a large group of people talking filtered with wacom interface
and played into transducers into the piano

b a
c
x
ped

sim.

3
32

14″

4
32

7″

3
32

clb

8

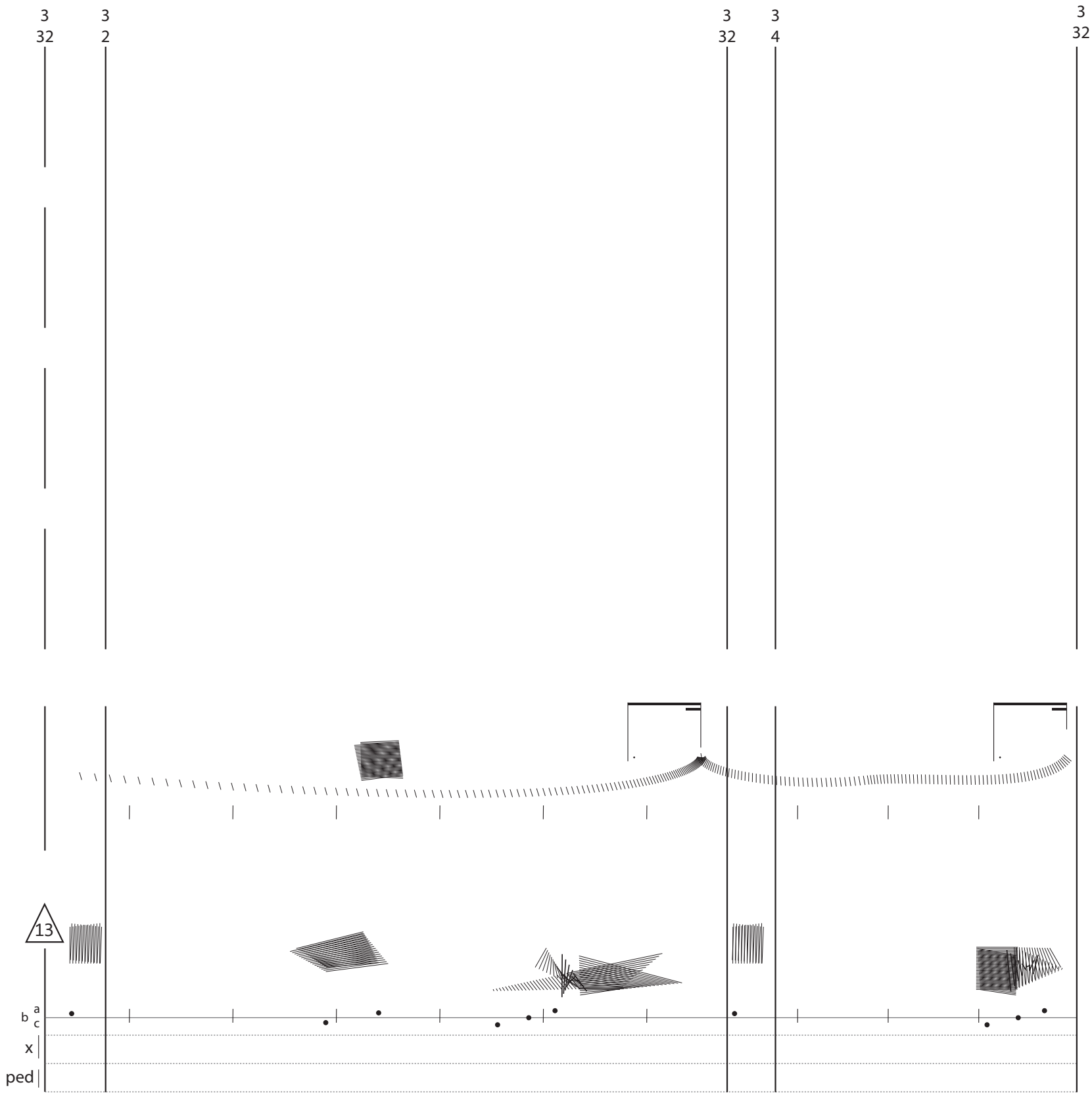
*p*

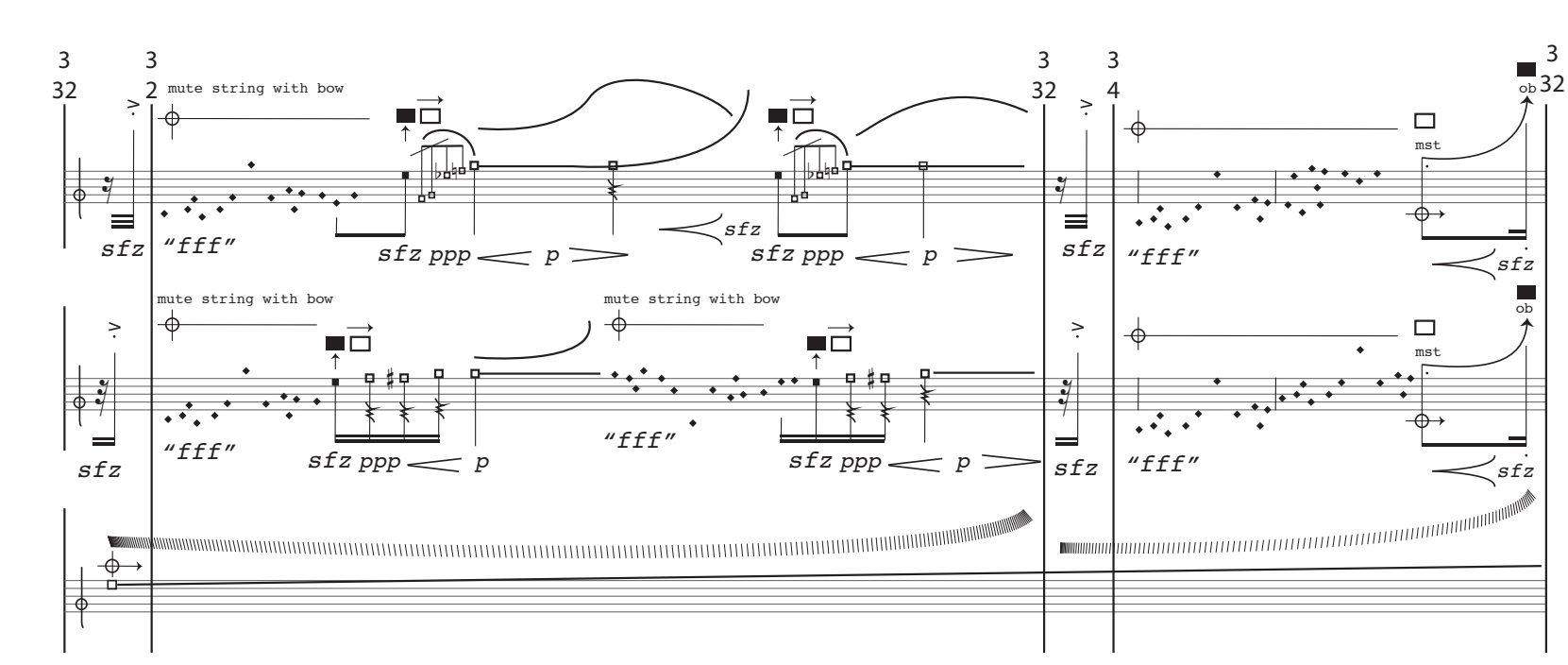
clb

8

*p*

50


3
32
3
2
3
32
3
4
3
32
13
a
b
c
x
ped

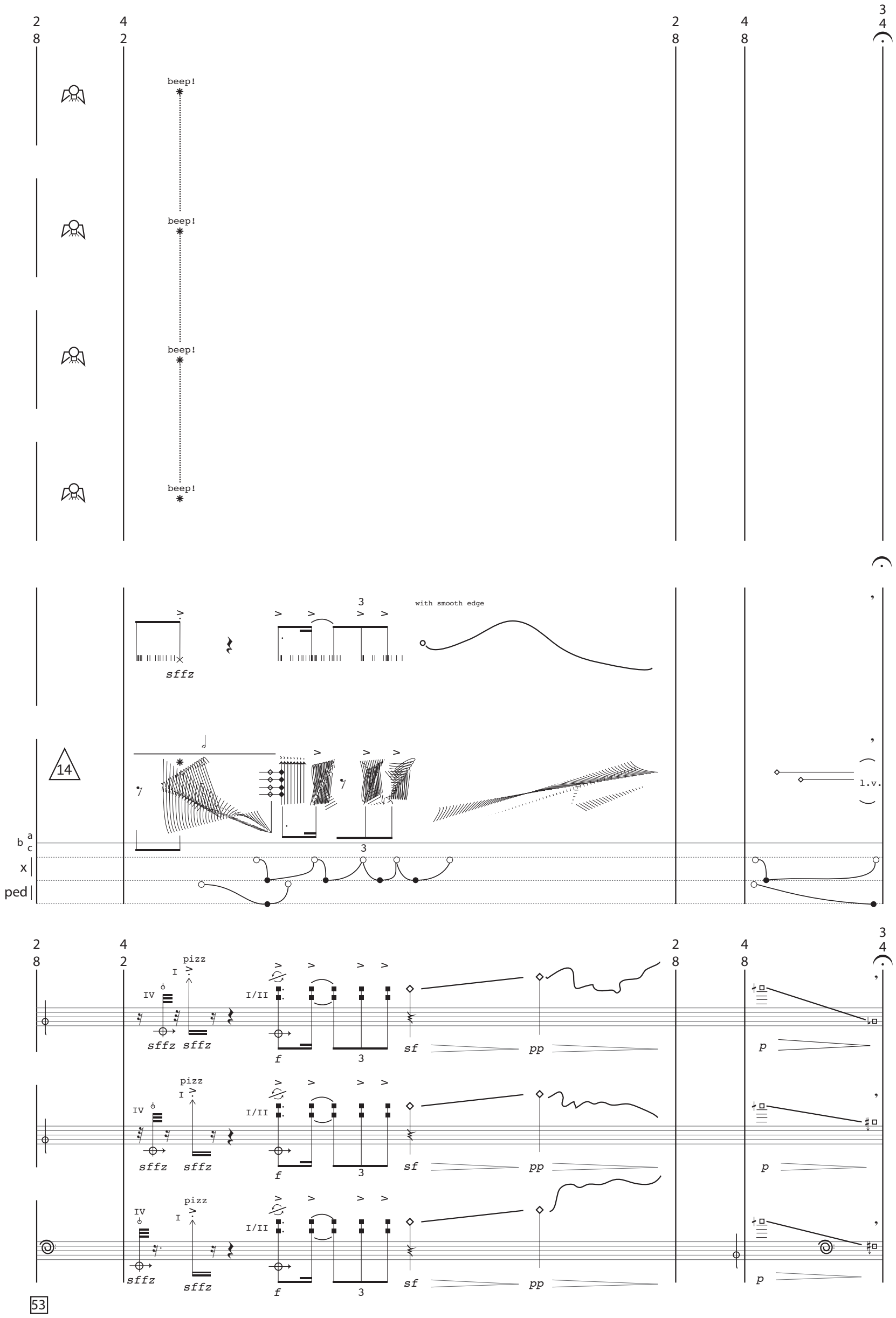

3
32
3
2
mute string with bow
sfz
"fff"
sfz ppp
p
sfz
3
32
3
4
3
32
ob
mst
mute string with bow
mute string with bow
51

3 3 3 2
32 2 32 8

b a
c
x
ped

msp
stagger bow movment
mst
ob
mst
sfz
pizz
mute string with bow
sffz
"fff"
sfz ppp p
"fff"
sfz ppp p sfz
sfz
pizz
sffz

52


beep!
beep!
beep!
with smooth edge
sffz
14
l.v.
pizz
IV
I
I/II
sffz
f
3
sf
pp
p
53

3/4 5/16 5/4 6/16 3/4 7/16 5/4 5″

rocks

finger tip

crush

*pp*

*p*

*pp*

b a c

x

ped

3/4 5/16 5/4 6/16 3/4 7/16 5/4 5″

ob

mst

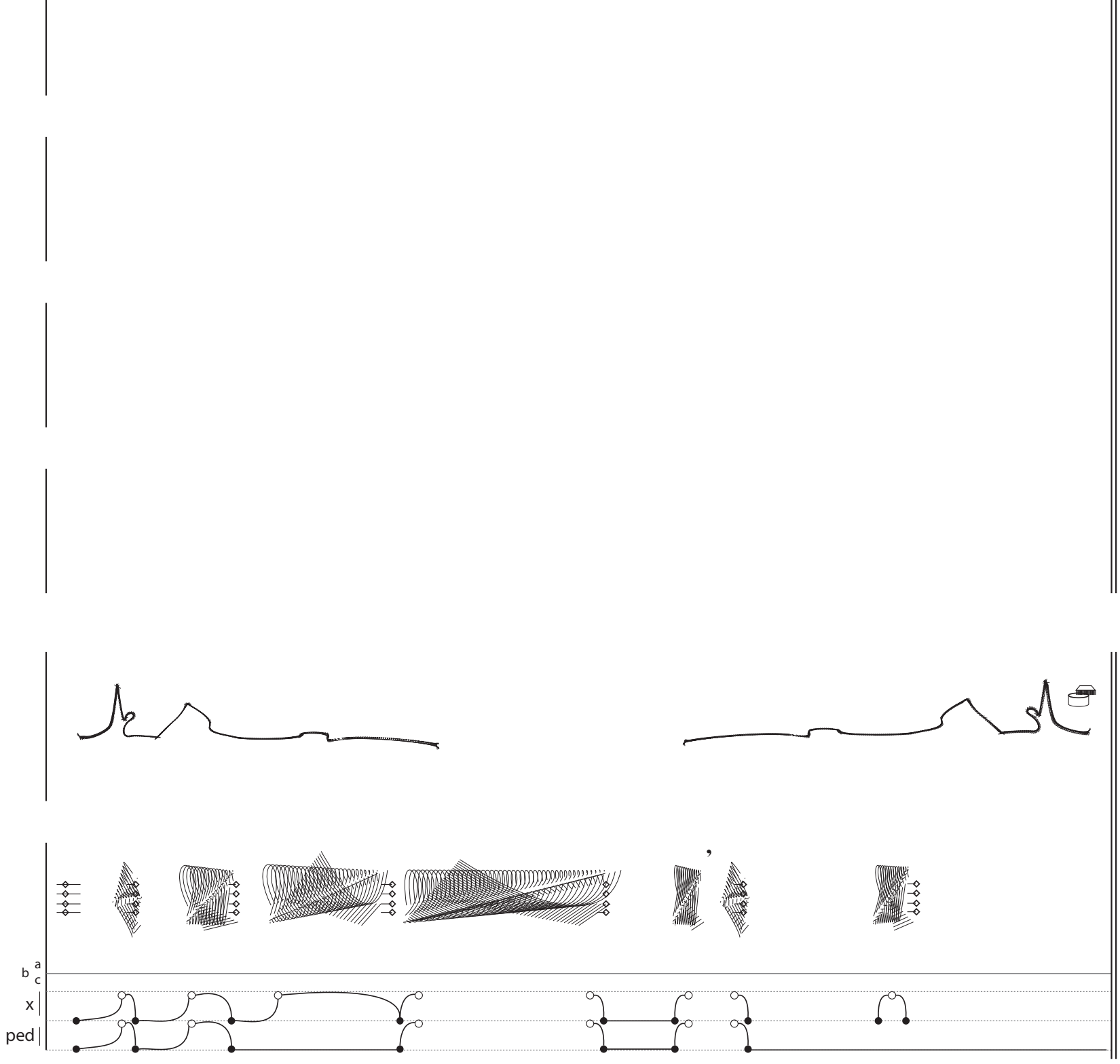
*mp* *pp* *p*

jeté

54

5″

3
32




5″

3
32

bow just on the boarder of pitch
senza vibr.

*pp*

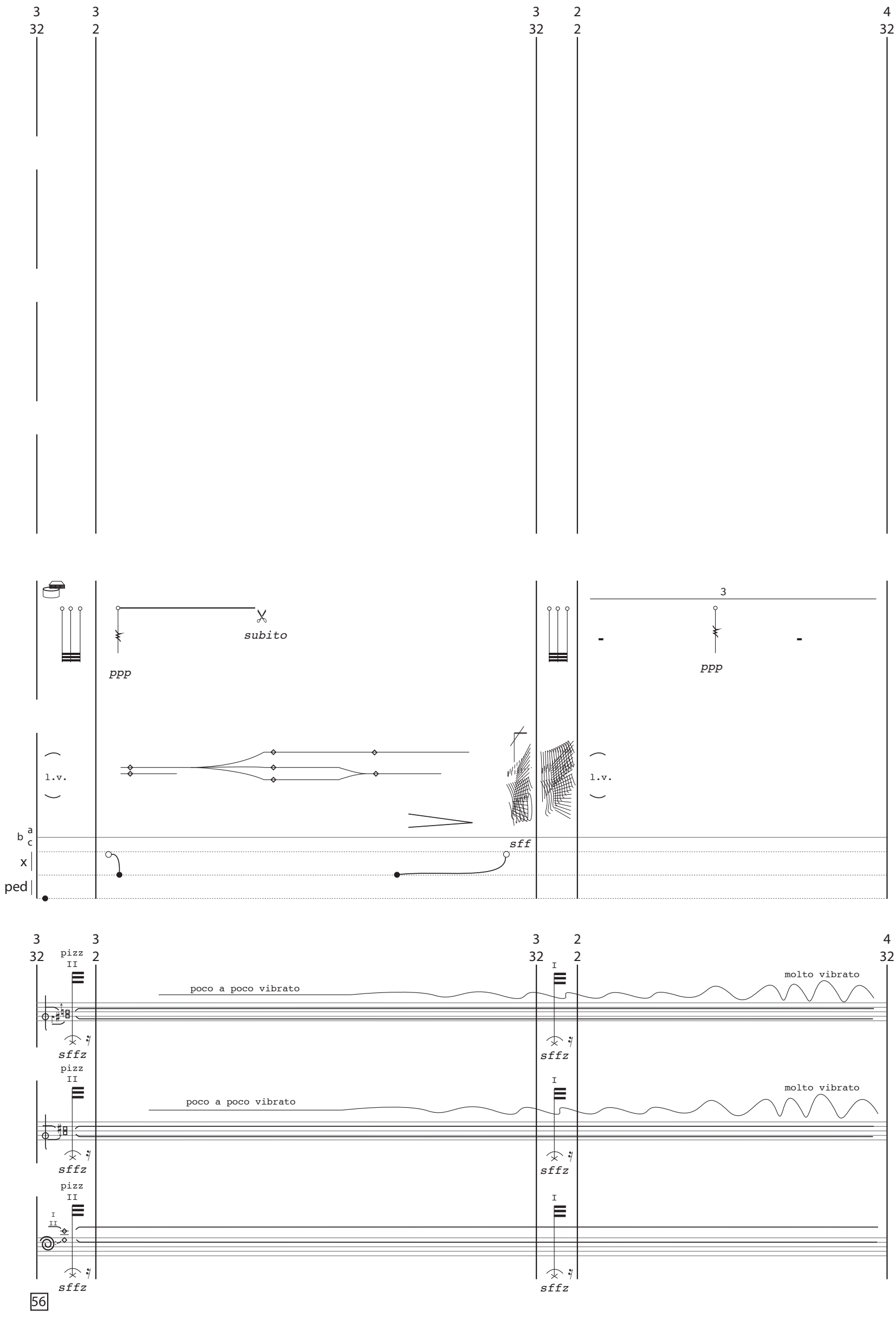
bow just on the boarder of pitch
senza vibr.

*pp*

bow just on the boarder of pitch

*pp*

55


3
32
3
2
3
32
2
2
4
32
subito
ppp
l.v.
3
ppp
l.v.
sff
b a
c
x
ped
pizz
II
poco a poco vibrato
molto vibrato
sffz
I
56

4/32 2/4 4/32 3/4 3/32 4/32 5/8

l.v. ppp l.v.

b a c
x
ped

4/32 2/4 4/32 3/4 3/32 4/32 5/8

pp p ppp p mp ppp mp "fff"

57

5/8 5/32 2/8 3/2 10″

ppp mf

l.v. piano 8 p

b a c
x
ped

5/8 5/32 2/8 3/2 10″

col lengo glissando

col lengo glissando

col lengo glissando

58

10″

wacom + percussion in speakers

wacom + percussion in speakers

wacom + percussion in speakers

wacom + percussion in speakers

unconducted unison with piano

15

b a c

x

unconducted unison with percussion

ped

10″

59

10″

7″

b a c

x

ped

10″

7″

60

7″

10″

(end unison)

cymbal

*pp*

b a c

x

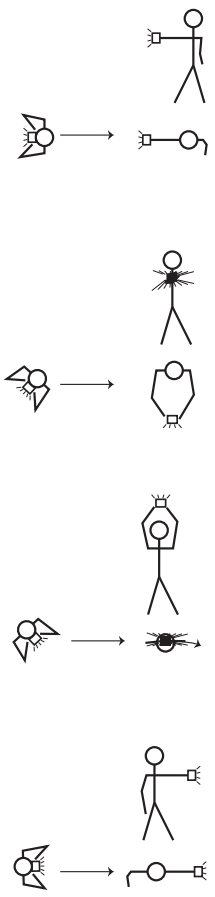
ped

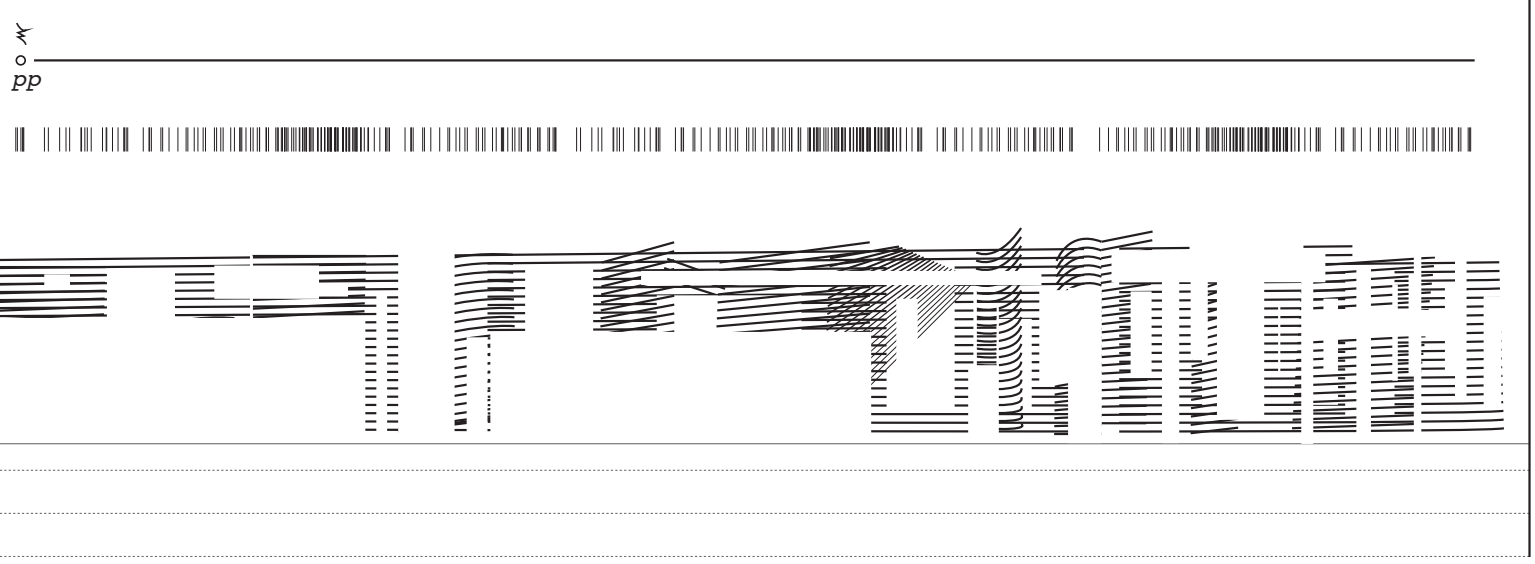
7″

10″

61

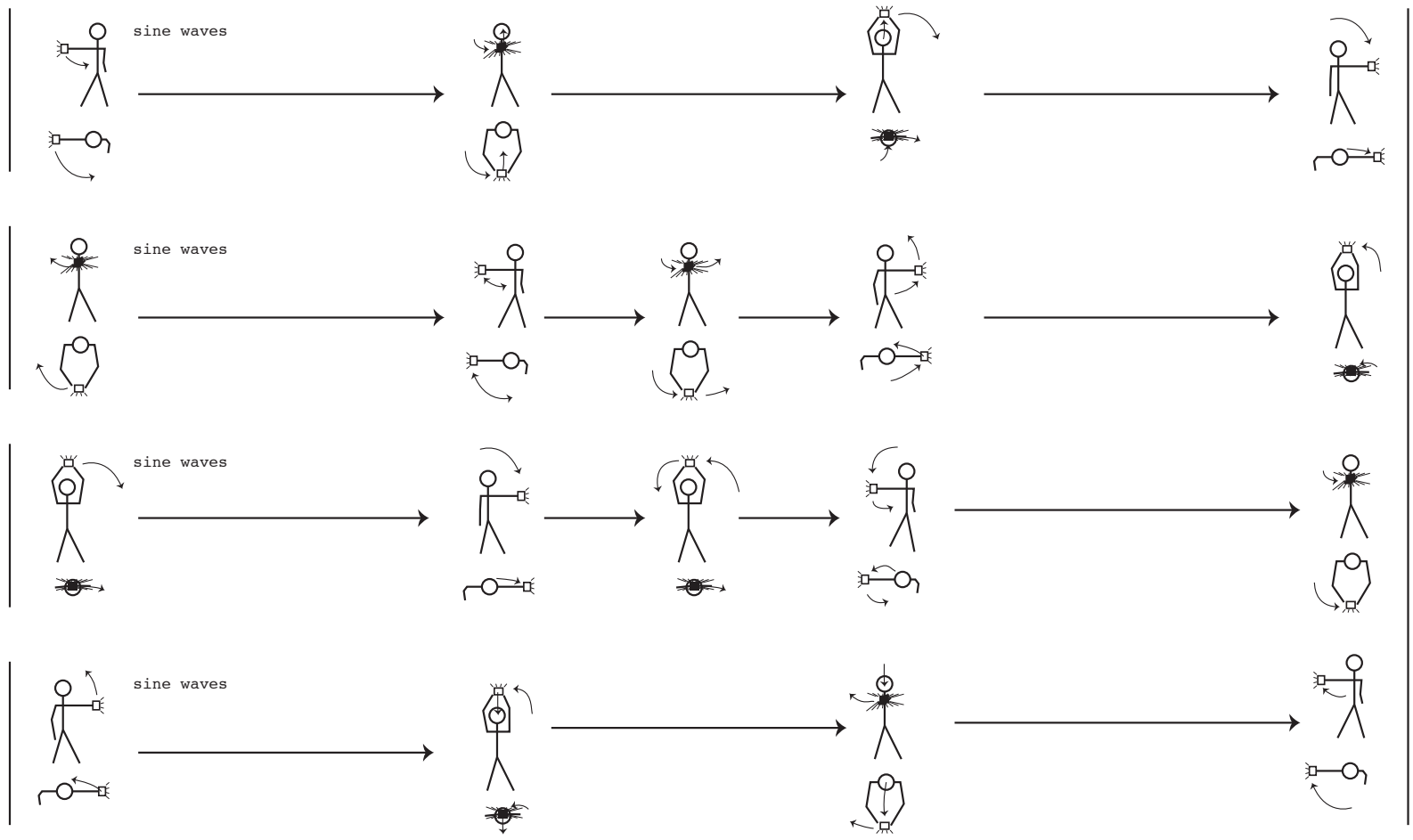
10″

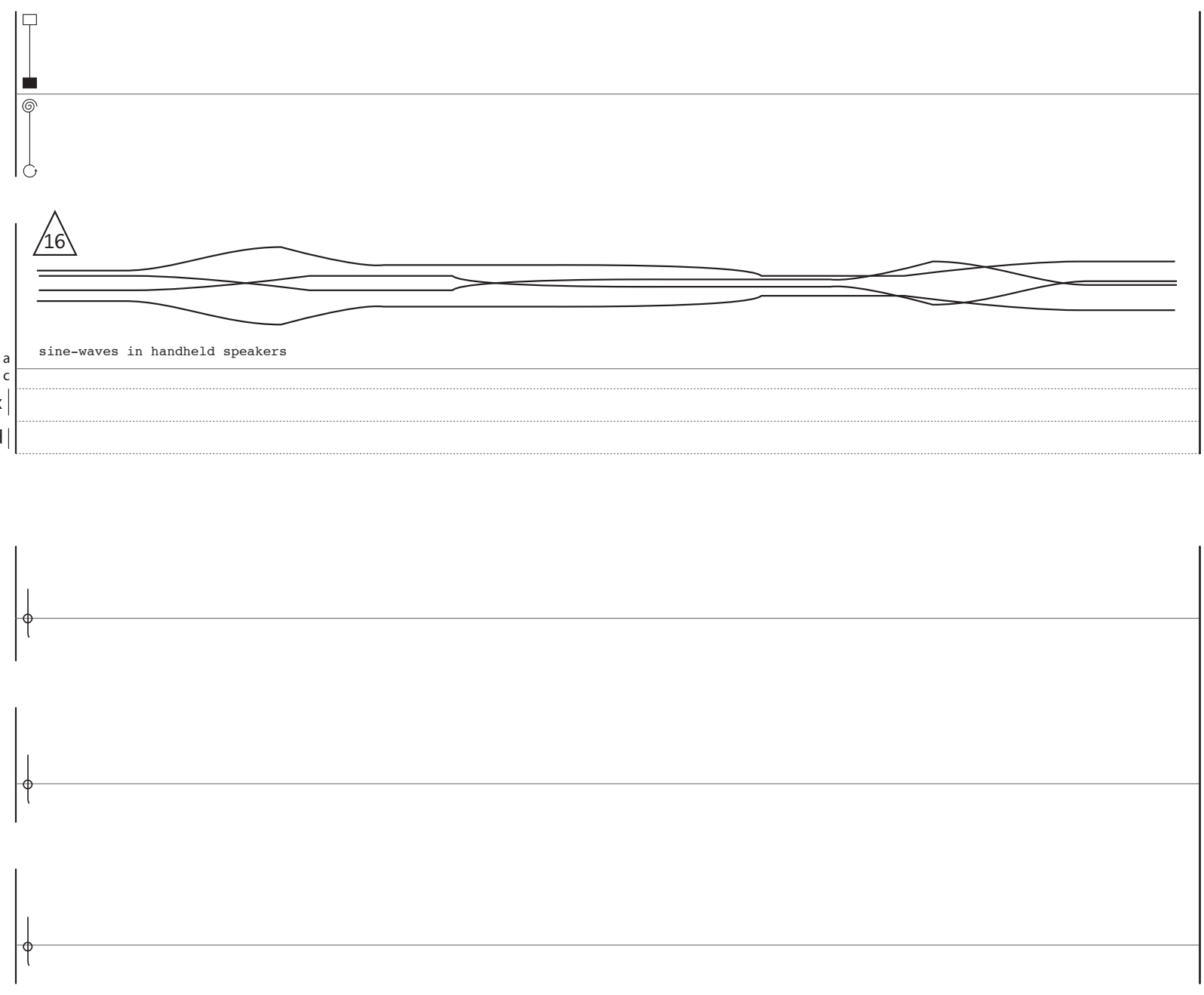




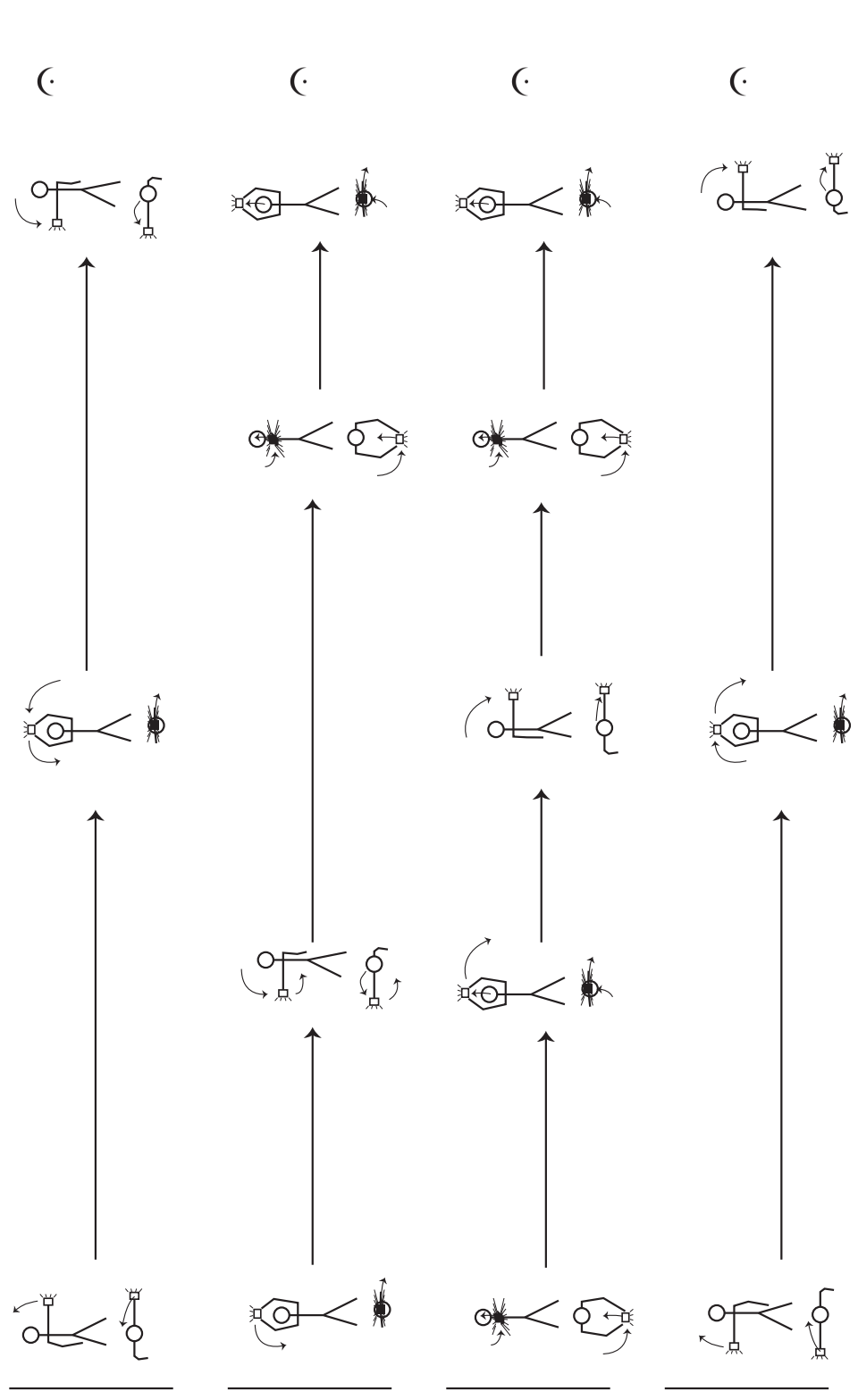

10″

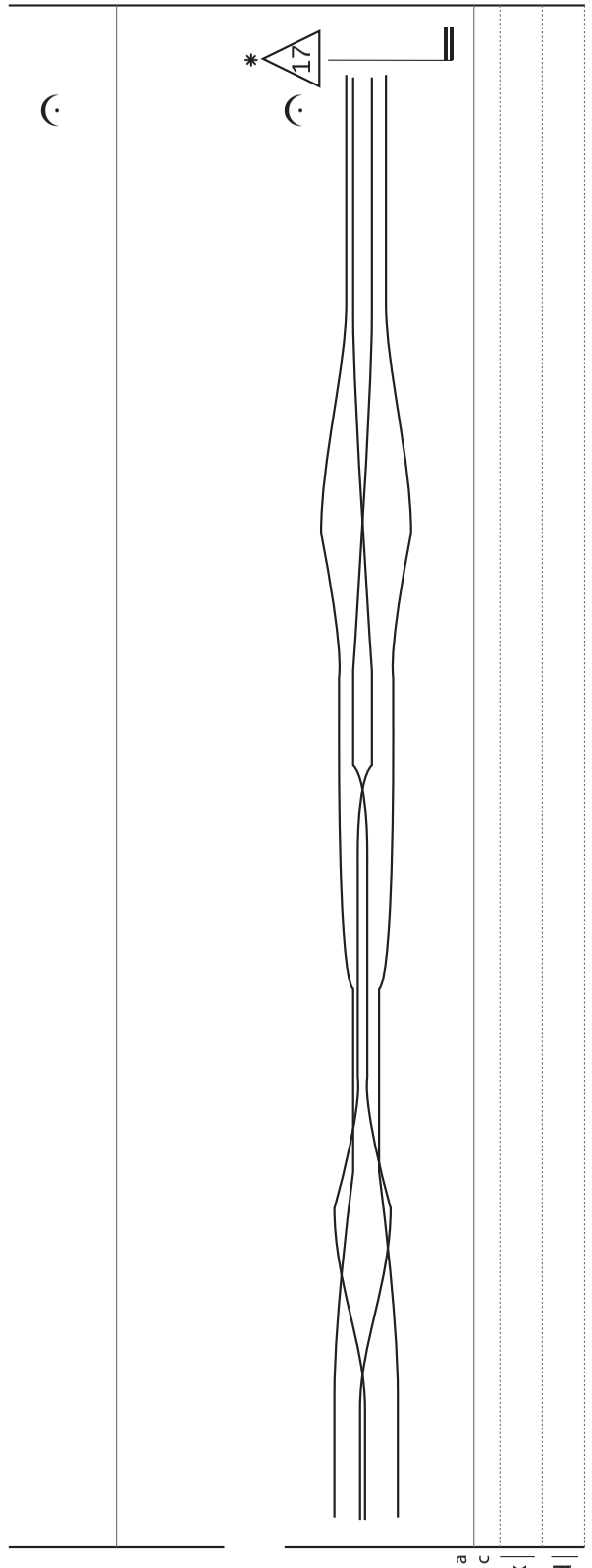
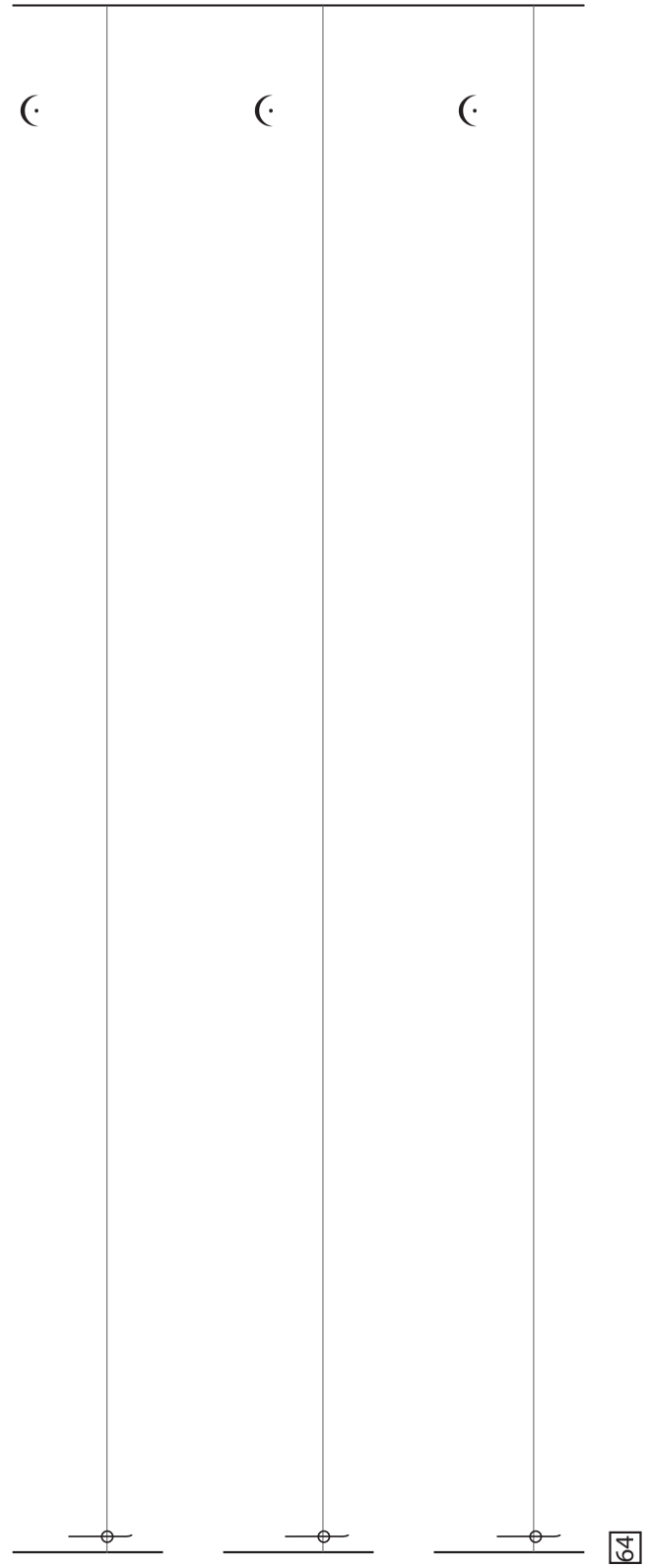
62


sine waves
sine waves
sine waves
sine waves


16
sine-waves in handheld speakers
b a c
x
ped

63




17
a
b
c
x
ped