

Johan Svensson

# ampèrian loops - part III

for ensemble and electro-mechanical devices

2017

*commissioned by and dedicated to ensemble mosaik  
with support from Ernst von Siemens Music Foundation*

*dur: 14 min*

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ABOUT AMPÈRIAN LOOPS

*ampèrian loops - part III* is the third and final piece in the cycle *ampèrian loops*. all pieces in the cycle are written for ensemble and electro-mechanical devices and have computer controlled solenoids as a core element of the music. a solenoid is a device consisting of an inductive coil around a movable steel or iron slug. when the electro-magnet is switched on, the slug goes out. sounds are created when the solenoid slugs hits the objects. the solenoids are controlled with a computer via an arduino (an open-source electronics prototyping platform).

*ampèrian loops - part I* (2013) for bass flute, half clarinet, metal can, piano, violin, viola, cello and electro-mechanical devices [solenoids] dur: 14'

*ampèrian loops - part II* (2015) for piccolo/bass flute, bass clarinet, percussion, violin, cello, keyboard, vibrators [keyboard pedals or 1 extra performer] and electro-mechanical devices [solenoids and transducers] dur: 16'

*ampèrian loops - part III* (2017) for piccolo/bass flute, bass clarinet, percussion, violin, cello, keyboard, vibrators [1 performer] and electro-mechanical devices[solenoids and transducers] dur: 14'

INSTRUMENTATION

piccolo/bass flute

bass clarinet

- + plastic pipe clarinet [length ≈ 3 m]\*
- + 500 ml glass bottle

percussion

- sand paper blocks
- castanets
- 330 - 500 ml glass bottle
- small metal object
- small bongo
- metal sheet [dim. ≈ 85x35 cm]\*
- 2 hard mallet, medium/double mallet, drum stick
- handheld milk frother

violin

cello

vibrator interface

*controlling:*

- 5 modified mini vibrators\* attached inside a grand piano
- + 250 ml glass bottle

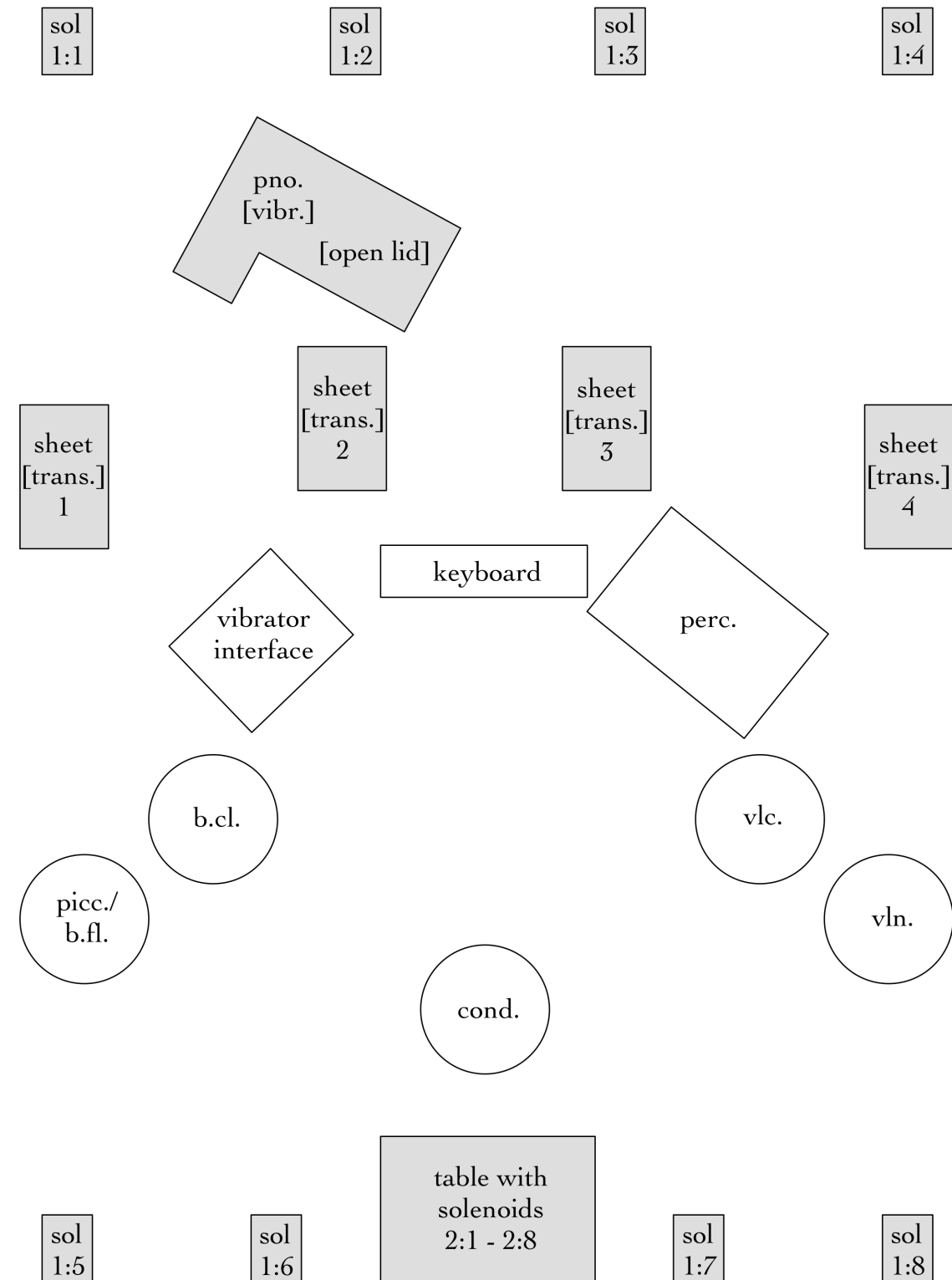
MIDI keyboard [88 keys]

- + computer with max/msp 7.3.4 or later

*controlling:*

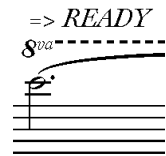
- 4 transducers\* attached on 4 metal sheets [dim. ≈ 85x35 cm]\*
- 16 solenoids\* [2 sets à 8 solenoids]

STAGING



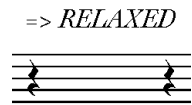
\* = can be provided by the composer

## GENERAL INSTRUCTIONS



### **READY / RELAXED**

**READY**: put hands [ bow / mouth / fingers ] on the instrument as if being ready to play. make the change quickly where the '=>' is. stay in a ready position until => **RELAXED** is written.



**RELAXED**: stay in a relaxed position as if having a 50 bar rest. make the change quickly where the '=>' is. stay in a relaxed position until => **READY** is written.

READY / RELAXED should not be theatrically exaggerated: it should be a sudden shift in energy rather than a choreography. feel free to do necessary preparations during RELAXED or just before the transition to READY [page turning, finding mouth / finger position etc.].

from bar 70 onwards, READY / RELAXED is not specified anymore. make the changes in an ordinary way.

**dynamics** are written in two different ways:

mp = sounding dynamic: mezzo piano. a great amount of action/power might be necessary to reach the written dynamic level.

“ff” = action dynamic: fortissimo. sounding result is probably much softer.

### **pitch notation**



three quarter tones flat, half tone flat, quarter tone flat, natural, quarter tone sharp, half tone sharp, three quarter tones sharp.

**staccato**, always as short and dry as possible.

## PLAYING TECHNIQUES AND SPECIFICATIONS

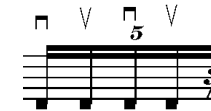
### PICCOLA / BASS FLUTE



aeolian sounds; pitches mixed with much air sound. this is produced by placing the mouth further away from the embouchure than is usual. the pitches will be approx. a half tone sharper than usual.



tongue pizz. always as short and dry as possible.



air sound. closed embouchure (breath: out-in-out-in).



flutter tongue.

### BASS CLARINET



air sound, open embouchure.



kissing sound. always short and dry.



slap tongue.



### *plastic pipe clarinet*

this instrument is made from 20 mm PVC pipe. it should be approx. 3 m long and have a reed made from a softer plastic [e.g. from a cream/ sour cream package]. picture of mouthpiece to the left.



tongue ram or slap tongue.

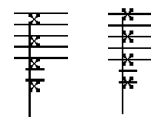


### *500 ml glass bottle*

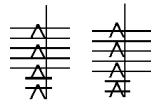
tune with water (tuning to the left). played by blowing into it.

## STRINGS

cello: IVth string should be tuned down one octave



hit strings with left hand, keep hand on strings until the release sign is written. while left hand is on the strings: adjust the hand to make other playing techniques sound (un-dampen strings, change finger positions etc.).



release left hand quickly.



legno battuto.



crini battuto.



tap.



damp string by touching it gently without pressing it. one finger touching the string on written pitch and at least two other fingers damping behind it.



drop the bow to make several short bounces. the bounces should last the full written duration.

## PERCUSSION

*sand paper blocks*

*castanets*

*350 - 500 ml glass bottle*

*small metal object*

*small bongo*

*metal sheet*

the metal sheet used should have the approx. dimensions 85x35 cm, and be identical to the 4 metal sheets used with transducers. **THE METAL SHEET SHOULD BE DAMPED THROUGHOUT THE PIECE!**

*2 hard mallet, medium/double mallet, drum stick and handheld milk frother*



metal sheet, bongo, metal object, bottle, castanets, sand paper blocks



dead strokes.



release quickly with a horizontal/scratching movement.



frother handle on instrument: soft motor sound.



whisk on instrument: noisy sound.

## VIBRATOR INTERFACE

5 modified mini vibrators should be attached inside a grand piano. the piano should have open lid and be placed behind the ensemble. the vibrator interface is custom made and has 5 buttons, one for each vibrator, plus 1 acoustic button: creating an acoustic sound both when being pressed and when being released.



the clef showing which vibrator to play.

HIGH: high strings, not damped. use strings behind bridge where the strings have very different intonation.

PEGS: on the tuning pegs.

MID: on g#<sup>1</sup> [middle octave], not damped. the pitch should be heard clearly both when vibrator is on and when it is turned off [fading out].

BASS: on mid-part of bass register, damped. the vibrator should hit several strings. noise rather than pitch.

SUB: a vibrator covered in rubber, e.g. finger from a rubber glove, on lowest string [low A], damped. should sound similar to a gran cassa trill.

*250 ml glass bottle*

played by blowing into it. the bottle should not be tuned with water, the pitch will be somewhat random.

the bottle should be placed on a wooden surface.

## KEYBOARD

a midi keyboard with 88 keys should be used. the keyboard is connected to a computer with max/msp (v. 7.3.4 or later) and a max/msp patch is controlling the transducers and the solenoids. above the keyboard notation there are three staves showing a representation of the sounding result of the keyboard action.

### *transducers on metal sheets*

4 transducers should be attached on 4 identical metal sheets [dim.  $\approx 85 \times 35$  cm].

### *solenoids*

there are 16 solenoids altogether divided into 2 sets à 8 solenoids. each solenoid has a LED attached to itself. each time a solenoid is hitting an object, the LED is flashing. But the LED is sometimes flashing without having a solenoid hit.

### *solenoid set 1*

The solenoids are grouped in couples with a visual connection between their objects:

solenoid 1 and solenoid 5

solenoid 2 and solenoid 6

solenoid 3 and solenoid 7

solenoid 4 and solenoid 8

sol 1: metal plate (small)

sol 2: flower pot (ceramic)

sol 3: box (wood)

sol 4: jar (glass)

sol 5: metal plate (big)

sol 6: flower pot (plastic)

sol 7: box (cardboard)

sol 8: can (plastic)

Solenoid 5-8 are attached to objects creating softer sounds than the objects solenoid 1-4 are attached to.

HARD  
metal/pot  
H box/far  
metal/pot  
box/far  
SOFT

how the solenoids are distributed in the staff.

### *solenoid set 2*

4 solenoids should be attached to metal plates and 4 attached to plastic pipes [20 mm PVC; same kind as the clarinet is made from].

the size of the metal plates should be:

sol. 1-2: approx. 10x4 cm

sol. 3-4: approx. 40x10 cm

on one end on each of the 4 plastic pipes, a piece of thin oilcloth or rubber should be tightly attached [like a drum skin]. when hitting the oilcloth end with a finger it should sound like a raindrop with pitch. the pipes should be tuned in 4 octaves of Bb:

sol. 1: bb"

sol. 2: bb' [middle octave]

sol. 3: bb

sol. 4: Bb

small metal  
big metal  
H pipe 1-2  
pipe 3-4

how the solenoids are distributed in the staff.

## AMPLIFICATION

If *ampèrian loops - part III* is performed in a small-medium venue amplification is not necessary. if the venue is bigger or has very dry acoustics, all instruments and devices has to be amplified.

ampèrian loops - part III

Johan Svensson

score in C

6/4 = 60  
=> READY: bands / mouth on instrument  
(aeolian sound)

7/4 => RELAXED: fingers open / instrument from mouth  
(pizz.)

5/4 => READY

4/4 => RELAXED

5/8 => READY

4/4

3/8 => RELAXED

b.fl. *f* key click: all fingers (keep fingers on keys) release quickly: all fingers  
=> READY: fingers / mouth on instrument (air sound, open embouchure) => RELAXED: fingers open / instrument from mouth (kissing sound)  
*p*

b.cl.(Bb) *f* key click: all fingers (keep fingers on keys) release quickly: all fingers  
=> READY: band / bow on instrument (hit strings with bow, keep bow on strings) => RELAXED: bands down (some resonance from strings, not too much) (release bow from strings)  
*f* (hit strings with left hand, keep hand on strings) (release left hand)  
*f* (hit strings with bow, keep bow on strings) (release bow from strings)  
*f* (hit strings with left hand, keep hand on strings) (release left hand)

vln. II, III *f* (hit strings with bow, keep bow on strings) (release bow from strings)  
*f* (hit strings with left hand, keep hand on strings) (release left hand)

vlc. II, III *f* (hit strings with bow, keep bow on strings) (release bow from strings)  
*f* (hit strings with left hand, keep hand on strings) (release left hand)

(hard mallets) (milk frother) METAL OBJECT (small) => READY: sticks on instruments (dead strokes) (release quickly with a horizontal/scratching movement) => RELAXED: bands down  
BONGO (small) *p* => READY: bands on instruments (acoustic button) (push down) (release button) => RELAXED: bands down  
vib./obj. HIGH PEGS (noise sound) (lights only) (keep holding bottle on surface) (release bottle quickly) (scratch bottle against wooden surface) GLASS BOTTLE (lift bottle) silently put bottle down

perc. BONGO (small) *p* => READY: bands on instruments (acoustic button) (push down) (release button) => RELAXED: bands down

vib./obj. HIGH PEGS (noise sound) (lights only) (keep holding bottle on surface) (release bottle quickly) (scratch bottle against wooden surface) GLASS BOTTLE (lift bottle) silently put bottle down

sheets transd. (noise sound) (lights only)

set 1 HARD metal/pot box/jar metal/pot box/jar SOFT

solenoids small metal big metal pipe 1-2 pipe 3-4

keyb. *8va* => READY: bands on keys => RELAXED: bands down

KEYBOARD MAPPING #1



8 **3** => READY **7** **4** **2** **4** **3** **8** => READY **3** **4** **2** **4** **5** **8**

b.fl. *f* *mp* *f* *p* *f* *p* *pp* *p* *f*

b.cl.(B♭) *f* *mp* *f* *p* *f* *p* *pp* *p* *f*

vln. *f* *mp* *f* *f* *f* *pp* *f*

vlc. *f* *mp* *f* *f* *f* *p* *f*

perc. METAL SHEET (damped) (medium/double mallet)

vib./obj. *p* (vibrator controller, 3rd button) *p* silently put bottle down

sh. sol. *f* *pp* *f* *f* *f* *f* *f* *f*

keyb. *f* *pp* *f* *f* *f* *f* *f* *f*

Annotations: => RELAXED, key click: all fingers, release quickly: all fingers, arco, pizz., II, III, II (5), III (7), HIGH MIDS, MID RANGES, SUB



5 8      7 8      5 8      7 8      5 4      7 4      4 4

15 *p* => *READY*

b.fl. *f* *p* *mp* *p* *pp* *mp* *f* *mf* *p* *f* => *RELAXED*

b.cl.(Bb) *p* => *READY* (slap tongue) *mf* => *RELAXED* *f*

vl. II, III => *READY* *mp* *f* *pp* *mp* pizz. (tap) *ff* (keep hand on strings) *f* => *RELAXED*

vlc. II, III => *READY* *mp* *f* *p* II (5) III (7) pizz. (tap) *ff* (keep hand on strings) *f* => *RELAXED*

perc. => *READY* *p* (frother handle on bongo) (soft motor sound) *p* *mp* *p* => *RELAXED*

vib./obj. => *READY* (vibrator controller, 5th button) *p* silently put bottle down *p* => *RELAXED*

sh. (low pitch) (gliss. up) (buzz)

sol.

keyb. => *READY* *8va* => *RELAXED*

**A** ♩ = 72  
=> READY

**7** **4/4** **3/4** **4/4**

b.fl. *p* *f* key clicks: all fingers key clicks: left hand fingers (pizz.) *mf mp pp mp mf mp* (all fingers) (left hand) *f p f p mf mp pp mp*

b.cl.(B♭) *p* *f* key clicks: all fingers key clicks: left hand fingers *mf mp pp mp mf mp* (all fingers) (left hand) *f p f p mf mp pp mp*

vl. II, III *f* *ff* arco *pp mp* pizz. (legno battuto) *f* II, III *f* *ff* *mp* pizz. *pp mp f*

vlc. II, III *f* *ff* arco *mp* *p* arco II (5) III (7) *mp* pizz. (legno battuto) *ff f* II, III *f* *ff* *mp* *p* II (5) III (7) *mp f* pizz.

perc. *p* ord. *mp* GLASS BOTTLE *p mp p*

vib./obj. *p* (continue holding the bottle) *p* *p*

sh. (gliss. down) *g#1*

sol.

keyb. *g<sup>ua</sup>* *g<sup>ua</sup>*

4/4

3/4

4/4

3

7/4

26

**b.fl.**

**b.cl.(B♭)**

**vl.**

**vlc.**

**perc.**

**vib./obj.**

**sh.**

**sol.**

**keyb.**

Dynamic markings: *p*, *f*, *mp*, *mf*, *pp*, *ff*, *tr*.

Performance instructions: *arco*, *pizz.*, *tr*.

Technical markings: *II, III*, *II (5) III (7)*, *8<sup>va</sup>*, *8<sup>vb</sup>*.

Articulation: slurs, accents, *mf* (marcato), *tr* (trills).

Groupings: *3* (triplets), *mf* (marcato), *tr* (trills).

**B**

$\frac{7}{4}$   $\text{♩} = 60$  *(READY)*

**3** **5** **3** **5** **7** **3**

$\Rightarrow$  RELAXED  $\Rightarrow$  READY  $\Rightarrow$  RELAXED

30 *f* *p* *pp* *f* *mf* *f*

b.fl. *f* *p* *pp* *f* *mf* *f*

key click: all fingers *(READY)* release quickly: all fingers

b.cl.(Bb) *f* *mf* *p* *f* *pp* *mf* *f*

key click: all fingers release quickly: all fingers

vln. *f* *pp* *ff*

vcl. *f* *p* *f*

perc. *p* *p* *p*

vib./obj. *p* *p*

sh. *(buzz)* *(speed 2)* *(speed 1)*

sol. *(READY)* *8va*

keyb. *(READY)* *8va*

3 => READY 4 3 4

36 *p* *f* *mp* *f* *mp* *mf* *p* => RELAXED

b.fl.

*p* *f* *mp* *mf* *f* *mp* *mf* => RELAXED

b.cl.(Bb)

*pizz.* *mp* *ff* *f* => RELAXED

vln.

II, III *f* *mp* *f* *ff* *f* => RELAXED

vlc.

perc. *p* *mp* *p* *mp* *p* => RELAXED

vib./obj. *p* => RELAXED

sh.

sol. lights ON soft metal and box

keyb. *8va* => RELAXED

(turning off sound in metal sheets)

**4/4** **C**  
♩ = 72  
=> READY

**3/4**

**4/4**

**7/8**

**4/4**

**b.fl.**  
45  
p  
f (all fingers) (left hand)  
=> READY  
mf mp  
pp mf mp mf mp  
f p f p mp mf pp  
mf 3 mp mf mp mf p

**b.cl.(Bb)**  
p  
f (all fingers) (left hand)  
=> READY  
mf mp  
mf pp mf mp  
f p f p mp mf pp  
mf 3 mp 3 mf p

**vln.**  
II  
f  
=> READY  
f ff mp  
pp pizz. 3  
mp f  
II, III  
f  
ff  
pp  
pizz. 3  
mp f ff  
II, III

**vlc.**  
II  
f  
=> READY  
f ff mp  
II (5) III (7) p pizz. 3  
mp f ff f  
II, III  
f  
ff II (5) III (7) p  
pizz. 3  
mp 3 f ff f ff f  
II, III

**perc.**  
p  
=> READY  
mp  
mp  
p mp  
mp p

**vib./obj.**  
p  
=> READY  
p  
p (continue holding the bottle) p p

**sh.**  
g#1  
p

**sol.**  
7  
=> READY  
p

**keyb.**  
p  
=> READY  
p

4  
4

3  
4

2  
4

Musical score for orchestra and keyboard, measures 47-54. The score is divided into two systems by a double bar line. The first system is in 4/4 time, and the second system is in 3/4 time. The instruments are: b.fl., b.cl.(Bb), vln., vlc., perc., vib./obj., sh., sol., and keyb. The score includes various dynamics (f, p, mp, mf, pp, ff), articulations (pizz., arco), and performance instructions (II, III, II (5), III (7), g<sup>sub</sup>, tr). The key signature is one sharp (F#).

2  
4

4  
4 D

3  
4

4  
4

51

b.fl. *pp mp f p mp pp mp mf mp*

b.cl.(Bb) *pp mp mf mp f p mp pp mf mp mf mp*

vl. *pp mp ff f p p mp ff f ff f ff f*

vlc. *p mp f ff f mp mp f ff f ff f ff f*

perc. *mp mp p p mp*

vib./obj. *p p*  
(continue holding the bottle)

sh.

sol.

keyb.



4  
4

6  
4

4  
4

55

b.fl. *p mp mf mp mf mp p mp mf mp*

b.cl.(Bb) *p mp mf mf mp p mp "f" mp mf mp*

vl. *"ff" pizz. mp "ff" "f" "ff" "f" mp "ff" "f" "ff"*  
(crini battuto) *mp*

vlc. *mp "ff" "ff" "f" "ff" "f" mp (pizz.) mp "ff" "f" "ff" "f" "ff" "f"*  
(crini battuto)

perc. *mp p mp p mp p*  
(acoustic button)  
(push down and release quickly)

vib./obj. *p*  
put bottle down

sh. *8va*

sol.

keyb. *legato sempre 8va*

9  
16

5<sup>E</sup>  
4 ♩ = 96

59

b.fl. *mf mp mf p mp* *f mp mf* *mp 3 mf* *f mf* *mp* *f*

b.cl.(B♭) *p mf mp* *mp mf* *mp mf* *f mf* *mp* *f mf*

vl. (pizz.) *f ff* *f ff* *f ff* *f ff* *mp* *f ff* *f ff* *f ff* *f* *mp* *ff* *mp ff* *mp ff*

vlc. (pizz.) *f ff* *f ff* *f ff* *mp mp* *f ff* *ff* *mp ff* *mp ff* *mp ff* *mp ff* *mp ff* *mp ff*

perc. *p mp* *p* *mp p mp* *p mp*

vib./obj. *HIGH MIDS LOW SOFT*

sh. *tr♯'*

sol.

keyb. *8va*

4  
4

3  
4

65

b.fl.

b.cl.(Bb)

vl.

vlc.

perc.

vib./obj.

sh.

sol.

keyb.

4  
4

12  
4

3  
4

♩ = 60 *READY / RELAXED ad lib. sempre*

67

b.fl. *f* *mf* *f* *mf* *ff* *READY / RELAXED ad lib. sempre*

b.cl.(Bb) *f* *mf* *f* *mf* *ff* *READY / RELAXED ad lib. sempre*

vln. *mp* *ff* *mp* *ff* *mp* *ff* *ff* *READY / RELAXED ad lib. sempre*

vlc. *mp* *ff* *mp* *ff* *mp* *ff* *ff* *READY / RELAXED ad lib. sempre*

perc. *p* *mp* *p* *mp* *p* *mp* *f* *READY / RELAXED ad lib. sempre*

vib./obj. *HIGH MIO. BASS SUB* *READY / RELAXED ad lib. sempre*

sh. cluster around 11 000 Hz

sol. *READY / RELAXED ad lib. sempre*

keyb. *8va* *15va* *8vb* (change keyboard mapping)

**F**

**3/4** ♩ = 72

PICCOLO  
(air sound: closed embouchure)  
(breath out)

**5/4**

**2/4**

(breath out - in - out)

**5/4**

(pizz.)

**2/4**

**3/4**

(aeolian sounds)

71

picc. *ff*

PLASTIC PIPE CLARINET  
(tongue ram / slap)

plast. pipe *ff*

vln. arco flaut. (flautando) (damp) *mp*

vlc. arco I (legno tratto) (damp) *mp*  
II etc. (ord.) *f*

perc. (ordinary sand paper sound) SAND PAPER *mp*

METAL SHEET *mp*

METAL OBJECT BONGO *f mp*

vib./obj. *mp*

sh. (fast linear pattern)

sol. (fast irregular pattern)

keyb. KEYBOARD MAPPING #2  
(15)

3

2  
4

5  
4

3

79

pic. *mp* 3 *ff* *mp* *p* *ff* *mp* 3

plast. pipe *pp* < *ff* *ff* *f* *ff* *ff* *pp* < *ff*

flaut. *mp* 3 *mp* *mp* *mp* *mp* 3 *mp* 3

flaut. IV II III etc.

vcl. (pizz.) *p* arco *mp* *f* *mf* *pizz.* *p*

perc. *mp* *mp* *mp* *f* *mp* 3 *mp*

vib./obj. *mp* 3

sh. (noise gliss.)

sol.

keyb.

3

4/4 G

2/4

1/4

4/4

150

86

pic. *ff* *mp* *ff* *mp* 3

plast. pipe *ff* *mp* *ff* *pp* *ff*

vln. flaut. IV etc. *mp* *ff* *mf* *mp* *mp* 3 3

vlc. (pizz.) *ff* arco (bow bounce) (crini) *mf* *ff* (pizz.) *p*

perc. *mp* *f* *mp* *mp* 3 *f* *mp* 3

vib./obj. HIGH MIDS LOW BASS SUB 3

sh.

sol.

keyb.

5/8

4/4

3/4

5/8

3/4

2/4

95

pic. *mp* *p* *mp* *p* *mp*

plast. pipe *ff* *pp* < *ff* *ff* *ff*

flaut. IV etc.

vln. *mp* *mp* *mp* *mp*

vcl. (pizz.) *ff* arco *mf* pizz. *p* (pizz.) *ff* arco *mf* pizz. *ff*

perc. *mp* *f* *f* *mp* *mp* *f* *f* *f*

vib./obj. HIGH  
MID  
LOW  
SOB

sh. (noise gliss.)

sol.

keyb.



2  
4

♩ = 120

3  
4

4  
4 ♩ = 72

3  
4

98

pic. *ff* *pp* *mp* *mp*

plast. pipe *f* *p* *mp* *mf*

vln. *pp* *ff* *mf* *ff* *mp* *ff* (tap) *ff* (tap)

vlc. *f* *p* *ff* *mf* *mp* *8<sup>vb</sup>* (crini battuto)

perc. *mp* *f* *mp* *f* *mp* (acoustic button) (push down and release quickly)

vib./obj. *HIGH MIDDLE LOW SUB*

sh. *♯1*

sol. (fast pitch sort pattern)

keyb. *8<sup>vb</sup>*

GLASS BOTTLE (blow into bottle) (pitch)

(PLASTIC PIPE CLARINET)

g- (sounding pitch)

II (5) III (7) arco

pizz. arco

arco flaut. IV etc. (crini battuto)

(frother handle on bongo) (soft motor sound)

**3**<sup>H</sup>  
**4** ♩ = 120

**3**  
**4**

**1**  
**4**

**3**  
**4**

**3**  
**8**

**2**  
**4**

**3**  
**8**

**3**  
**4**

105

picc. *ff* *p* *ff* *ff* *pp* *p*

plast. pipe *f* *ff* *f* *p* *mp*

vln. flaut. *mp* *mp* *pp* *mf* *mp*

vlc. (damp) l.t. III etc. (ord.) *mp* *f* *mp* *f* *8<sup>vb</sup>* *mf* *mp* *f* *8<sup>vb</sup>* *p* *mf* *8<sup>vb</sup>* *mf*

perc. *mp* *mp* *f* *mp* *mp* *mp* *f*

vib./obj. HIGH MTD BASS SUB

sh. *mf*

sol. *3* *3* *3* *3*

keyb. *3* *3* *3*

(GLASS BOTTLE) *p*

II (5)  
III (7)

3/4

2/4

3/4

2/4

3/4

2/4

110

pic. *ff* *ff* *pp* *p* *ff*

plast. pipe *ff* *f* *p* *mp* *ff* *f*

vl. flaut. *mp* *pp* *ff* *mf* *mp* *mp*

vlc. l.t. *mp* *f* *p* *ff* *mf* *mp* *f*

perc. *mp* *mp* *f* *mp* *f* *mp* *mp*

vib./obj. HIGH MEGS MID BASS SUB

sh. *g#1*

sol. *3* *3* *3*

keyb. *3* *3*

2/4

3/4

2/4

4/4  $\text{♩} = 72$

2/4

3/4  $\text{♩} = 120$

2/4

115

pic. *ff* *pp* *p* *mp* *mp*

plast. pipe *p* *mp* *ff* *mf*

vln. *pp* *f* *mf* *mp* *mp* *ff* *ff*

vcl. *p* *ff* *mf* *mf* *mp* *mp* *mp*

perc. *f* *mp* *f* *mp* *mp*

vib./obj. *mp*

sh.

sol.

keyb.

flaut. IV etc. *mp* *ff* *ff*

II (5)  
III (7)

pizz. arco

8<sup>va</sup> *mf*

8<sup>vb</sup> *mp*

(speed 1)

3

2/4 I

3/4

2/4

3/4

3/4

2/4

3/4

122

pic. *ff* *pp* *p* *ff* *p*

plast. pipe *p* *mp* *ff* *f* *mp*

vln. *pp* *ff* *mf* *mp* *ff* *mf* *mp*

vcl. *p* *ff* *mf* *mp* *f* *ff* *mf* *mf*

perc. *f* *mp* *f* *mp* *f* *mp* *f* *mp*

vib./obj.

sh.

sol.

keyb.

II (5)  
III (7)

pizz. arco

flaut.

l.t.

8<sup>va</sup>

3 V

3 V

3 V

5

8<sup>va</sup>

8<sup>va</sup>

g<sup>-</sup>

3/4

2/4

3/4

2/4

3/4

2/4

128

pic. *ff* *ff* *pp* *p* *ff* *ff* *pp*

plast. pipe *ff* *f* *p* *mp* *ff* *f* *p* *mp*

vl. flaut. *mp* *pp* *ff* *mf* *mp* *pp* *ff* *mf*

vlc. l.t. *mp* *p* *ff* *mf* *mp* *p* *ff* *mf*

perc. *mp* *f* *mp* *f* *mp* *mp* *f* *mp*

vib./obj. *HIGH* *MID* *LOW* *SUB* BOTTLE (blow into bottle) (pitch)

sh. *g#1*

sol. *3*

keyb. *3*

2  
4

3  
4

4  
4

1  
4

2  
4

3  
4

5  
4

155

pic. *p* *ff* *ff* *pp* *p* *ff*

plast. pipe *ff* *f* *p* *mp* *ff* *f*

vln. *mp* *flaut.* *pp* *ff* *mp* *mp*

vcl. *mf* *l.t.* *mp* *f* *p* *mf* *l.t.* *mp* *f*

perc. *f* *mp* *mp* *f* *f* *mp* *mp*

vib./obj. HIGH PEGS NO BASS SUB

sh. *8<sup>va</sup>*

sol. *3*

keyb. *3*

*3* *V* *3* *V* *3* *V* *3* *V*

*g<sup>-</sup>* *pizz.* *arco* *flaut.*

*II (5)* *III (7)* *8<sup>va</sup>*

5/4

1/4

2/4

1/4

2/4

5/4

2/4

141

pic. *ff* *pp* *p* *ff* *pp*

plast. pipe *p* *mp* *f* *p* *f*

vln. *pp* *ff* *mp* *pp* *ff*

vcl. *p* *mf* *f* *p* *f*

perc. *f* *f* *mp* *mp* *f* *mp*

vib./obj. *HIGH* *MID* *LOW* *SUB*

sh. *f<sup>1</sup>*

sol.

keyb.



4  
4

2  
4

4  
4

148

20-30"

♩ = 72

pic. *ff* *pp* *ff* *pp* 20-30"

plast. pipe *p* *p* 20-30"

vln. arco *pp* *pp* 20-30"

vlc. II (5) III (7) *p* *p* 20-30"

perc. 20-30"

vib./obj. HIGH PEGS NO BASS SUB 20-30"

sh. *f* *f* 20-30"

sol.

keyb. 20-30"

J

2  
4

2  
4

♩ = 120

♩ = 72

4  
4

157

pic. *mp*

(air sound, open embouchure)

b.cl.(B♭) *mp* BASS CLARINET

flaut. IV etc. *mp* *ff*

vln. *mp* *ff*

vlc. *mp* *ff*

perc. *mp*

vib./obj. *mp*

sh.

sol.

keyb. *mp*



3  
4

3  
8

3  
4

4<sup>K</sup>  
4

5  
4

166

pic. *f* *mp* *mp*

b.cl.(B♭)

vl. *f* *mp* flaut. *mp* flaut. IV etc.

vlc.

perc. *f*

vib./obj. *f*

sh.

sol. *f* alberti pattern speed 1 (slow)

keyb. *f*

5  
4

4  
8

3  
4

5  
8

2  
4

2  
4

171

pic.

b.cl.(Bb)

vl.

vlc.

perc.

vib./obj.

sh.

sol.

keyb.

flaut.

alberti pattern speed 2

speed 3

speed 4

8va

HIGH  
MID  
LOW  
SOLO

flaut.

2  
4

4  
4  $\text{♩} = 120$

3  
4  $\text{♩} = 72$

4  
8

3

3  
8

176

Musical score for orchestra and keyboard, measures 176-180. The score is divided into five measures corresponding to the time signatures: 2/4, 4/4, 3/4, 4/8, 3, and 3/8. The instruments and parts are:

- picc.:** Piccolo, starting at measure 176. Dynamics: *mp*, *f*.
- b.c.l. (B♭):** Bass Clarinet in B-flat. Dynamics: *ff*, *f*.
- vln.:** Violin. Dynamics: *mp*, *ff*, *mp*, *f*. Includes instruction: "flaut. IV etc."
- vlc.:** Viola. Dynamics: *mp*, *f*. Includes instruction: "8<sup>ub</sup>" (8va up).
- perc.:** Percussion. Dynamics: *mp*, *f*. Includes hand icons.
- vib./obj.:** Vibraphone/Objekt. Dynamics: *mp*. Includes instruction: "HIGH MIDS MID BASS SUB".
- sh.:** Shofar.
- sol.:** Soli.
- keyb.:** Keyboard. Dynamics: *mp*. Includes instruction: "8<sup>ub</sup>" (8va up).

The score features various musical notations including triplets, slurs, and dynamic markings. The keyboard part includes a circled 8 and a dashed line indicating an octave shift.

5/8

2/4

3/8

1/4

3/8

5/8

5/4

3/8

3/4 <sup>L</sup> ♩ = 120

5/8

4/4

181

pic. *mp*

b.cl.(Bb)

flaut. *mp*

vlc.

perc.

vib./obj. HIGH MIDS BASS SUB

sh.

sol. *alberti pattern speed 3* *speed 4* *speed 5* *speed 6* *speed 7* *speed 8* *speed 9*

keyb. *g<sup>ua</sup>*

4/4

1/4

4/4

2/4

3/4

4/4

2/4

3/8

3/4

1/4

BASS FLUTE  
multiphonic

PLASTIC PIPE CLARINET

overpressure

8<sup>vb</sup>

x (whisk on metal sheet)

(fast pitch sort pattern)

8<sup>va</sup>

191

pic.

b.cl.(Bb)

vln.

vlc.

perc.

vib./obj.

sh.

sol.

keyb.



1  
4

4  
4

1  
4

3  
4

4  
4

2  
4

4  
4

3  
8

5  
8

200

musical score for various instruments including b.fl., plast. pipe, vln., vlc., perc., vib./obj., sh., sol., and keyb. The score includes dynamic markings like *ff* and *overpressure*, and performance instructions such as *multiphonic* and *8<sup>va</sup>*.

5

2  
4

5

3

5

2  
4

solenoid pattern played 20 times altogether ( approx. 24 " ),  
count repetitions and synchronize endings

4  
4

209

b.fl. *ff*

plast. pipe *ff*

vl. *ff* overpressure

vlc. *ff* 8<sup>vb</sup>

perc.

vib./obj. *ff* 8<sup>vb</sup>

sh.

sol. pattern played 20 times altogether 18x

keyb. 8<sup>va</sup> 8<sup>vb</sup> (change keyboard mapping)

4/4 M  
♩ = 60

216

b.fl. (aeolian sound) *mp* sempre

key click: right hand *ff* sempre

BASS CLARINET (air sound, open embouchure) *mp* sempre

b.cl.(B♭) key click: use several fingers to produce much sound *ff* sempre

vl. (crini battuto) *mp* sempre (l.v. sempre)

(tap) *ff* sempre (l.v. sempre)

vlc. (crini battuto) *mp* sempre (l.v. sempre)

*8<sup>vb</sup>* *mp* sempre

perc. BONGO METAL SHEET

vib./obj. (acoustic button) (push down and release quickly)

sh.

sol. solenoids slightly unsynchronizd (solenoids more or less unsynchronizd throughout the piece)

KEYBOARD MAPPING #3

keyb.

222

b.fl.

b.cl.(B♭)

vln.

vlc.

perc.

vib./  
obj.

sh.

sol.

keyb.

228

b.fl.

b.cl.(B♭)

vln.

vlc.

perc.

vib./  
obj.

sh.

sol.

keyb.

HIGH  
MIDS  
SUB

(two impulses in each solenoid)

(three impulses in each solenoid)

254

The score consists of the following parts:

- b.fl.**: Flute part with triplet eighth notes and rests.
- b.cl.(Bb)**: Clarinet in B-flat part with triplet eighth notes and rests.
- vln.**: Violin part with eighth notes and rests.
- vlc.**: Viola part with eighth notes and rests, including an *8<sup>va</sup>* marking.
- perc.**: Percussion part with eighth notes and rests.
- vib./obj.**: Vibraphone/Oboe part with eighth notes and rests, including a *3* marking.
- sh.**: Shofar part with rests.
- sol.**: Soli part with chords and rests.
- keyb.**: Keyboard part with eighth notes and rests.

N

240

b.fl.

(trill with right hand fingers)

b.cl.(Bb)

(trill with several fingers)

vl.

(bow bounce)

vlc.

(bow bounce) 8vb

perc.

vib./  
obj.

(push down) (release)

sh.

sol.

(several impulses in each solenoid, ritardando pattern)

keyb.

246

b.fl.

b.cl.(B♭)

vl.

vlc.

perc.

vib./  
obj.

sh.

sol.

keyb.

This musical score page contains measures 246 through 250. The instruments and their parts are as follows:

- b.fl. (Bass Flute):** Measures 246-247 are rests. Measures 248-249 feature a melodic line with a quintuplet (5) and a triplet (3). Measure 250 has a triplet (3).
- b.cl.(B♭) (Bass Clarinet):** Measures 246-247 are rests. Measures 248-249 feature a melodic line with a quintuplet (5) and a triplet (3). Measure 250 has a quintuplet (5).
- vl. (Violin):** Measures 246-247 are rests. Measures 248-249 feature a melodic line with a triplet (3). Measure 250 has a triplet (3).
- vlc. (Viola):** Measures 246-247 are rests. Measures 248-249 feature a melodic line with a triplet (3) and an 8va marking. Measure 250 has a triplet (3) and an 8va marking.
- perc. (Percussion):** Measures 246-247 feature a triplet (3). Measures 248-249 feature a triplet (3) and a triplet (3). Measure 250 has a triplet (3).
- vib./obj. (Vibraphone/Oboe):** Measures 246-247 feature a triplet (3). Measures 248-249 feature a triplet (3). Measure 250 has a triplet (3).
- sh. (Shofar):** Measures 246-247 are rests. Measures 248-249 feature a triplet (3). Measure 250 has a triplet (3).
- sol. (Soprano):** Measures 246-247 feature a triplet (3). Measures 248-249 feature a triplet (3). Measure 250 has a triplet (3).
- keyb. (Keyboard):** Measures 246-247 feature a triplet (3). Measures 248-249 feature a triplet (3). Measure 250 has a triplet (3).



O

252

Musical score for multiple instruments. The score is divided into systems for different instruments. The instruments listed on the left are: b.fl., b.cl.(Bb), vln., vlc., perc., vib./obj., sh., sol., and keyb. The score includes various musical notations such as treble and bass clefs, time signatures, notes, rests, trills, triplets, and dynamic markings. The key signature is one flat (Bb). The score is organized into measures, with some measures containing rests for certain instruments. The percussion part (perc.) features a rhythmic pattern of eighth notes. The woodwind parts (b.fl., b.cl.(Bb)) include trills and triplets. The string parts (vln., vlc.) feature triplets and eighth notes. The vibraphone/oboe part (vib./obj.) includes tremolos and eighth notes. The solo part (sol.) features a rhythmic pattern of eighth notes. The keyboard part (keyb.) includes a few notes and rests.

256

The musical score consists of the following parts:

- b.fl.**: Flute part with various melodic lines, including triplets and quintuplets.
- b.cl.(Bb)**: Bass Clarinet part with melodic lines and trills.
- vl.**: Violin part with melodic lines and triplets.
- vlc.**: Viola part with melodic lines and triplets, including an 8<sup>va</sup> (octave above) marking.
- perc.**: Percussion part with rhythmic patterns and triplets.
- vib./obj.**: Vibraphone and Object parts with melodic lines and triplets.
- sh.**: Shofar part with rhythmic patterns.
- sol.**: Soli part with rhythmic patterns.
- keyb.**: Keyboard part with melodic lines.

Measure numbers 256, 257, 258, 259, and 260 are indicated at the top of the score.

P

260

The musical score is arranged in a system of staves. From top to bottom, the staves are: b.fl. (Bass Flute), b.cl.(Bb) (Bass Clarinet in B-flat), vln. (Violin), vlc. (Violoncello), perc. (Percussion), vib./obj. (Vibraphone/Organ), sh. (Shofar), sol. (Soprano), and keyb. (Keyboard). The score is divided into three measures. The first measure starts at measure 260. The second measure is measure 261, and the third is measure 262. The woodwind parts (b.fl., b.cl., vln., vlc.) feature complex rhythmic patterns with triplets and quintuplets. The string parts (vln., vlc.) have a steady eighth-note accompaniment. The percussion part has a consistent rhythmic pattern. The vibraphone/organ part has a melodic line with triplets. The keyboard part has a simple harmonic accompaniment. A dynamic marking 'P' is placed above the first measure. The score includes various musical notations such as slurs, ties, and articulation marks.

265

b.fl.

b.cl.(Bb)

vln.

vlc.

perc.

vib./  
obj.

sh.

sol.

keyb.

This page of a musical score contains measures 265 through 268. The instruments and their parts are as follows:

- b.fl. (Bass Flute):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and quintuplets. Part 2 (bottom staff) features a bass line with trills and triplets.
- b.cl.(Bb) (Bass Clarinet):** Measures 265-268. Part 1 (top staff) features a melodic line with trills and triplets. Part 2 (bottom staff) features a bass line with trills and triplets.
- vln. (Violin):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and slurs. Part 2 (bottom staff) features a bass line with triplets and slurs.
- vlc. (Viola):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and slurs. Part 2 (bottom staff) features a bass line with triplets and slurs.
- perc. (Percussion):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and slurs. Part 2 (bottom staff) features a bass line with triplets and slurs.
- vib./obj. (Vibraphone/Organ):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and slurs. Part 2 (bottom staff) features a bass line with triplets and slurs.
- sh. (Shofar):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and slurs. Part 2 (bottom staff) features a bass line with triplets and slurs.
- sol. (Soprano):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and slurs. Part 2 (bottom staff) features a bass line with triplets and slurs.
- keyb. (Keyboard):** Measures 265-268. Part 1 (top staff) features a melodic line with triplets and slurs. Part 2 (bottom staff) features a bass line with triplets and slurs.

266

The musical score for measures 266-270 includes the following parts:

- b.fl.**: Flute part with complex rhythmic patterns, including quintuplets and triplets, and trills.
- b.cl.(Bb)**: Clarinet part with similar rhythmic complexity and trills.
- vln.**: Violin part with sixteenth-note runs and triplets.
- vlc.**: Viola part with sixteenth-note runs and triplets, including an 8va line.
- perc.**: Percussion part with a complex rhythmic pattern.
- vib./obj.**: Vibraphone and Object parts with sustained notes and rhythmic patterns.
- sh.**: Shofar part with sustained notes.
- sol.**: Soli part with sustained notes.
- keyb.**: Keyboard part with sustained notes.

269

b.fl.

b.cl.(Bb)

vl.

vlc.

perc.

vib./  
obj.

sh.

sol.

keyb.

This page of a musical score contains measures 269, 270, and 271. The instruments and their parts are as follows:

- b.fl. (Bass Flute):** Measures 269-271. Part 1 (top) features five-note runs, triplets, and trills. Part 2 (bottom) features a long trill in measure 269, followed by notes and trills.
- b.cl.(Bb) (Bass Clarinet):** Measures 269-271. Part 1 (top) features five-note runs, triplets, and notes. Part 2 (bottom) features a long trill in measure 269, followed by notes and trills.
- vl. (Violin):** Measures 269-271. Part 1 (top) features five-note runs, triplets, and notes. Part 2 (bottom) features notes and triplets.
- vlc. (Viola):** Measures 269-271. Part 1 (top) features five-note runs, triplets, and notes. Part 2 (bottom) features notes and triplets, with some notes marked  $8^{ub}$ .
- perc. (Percussion):** Measures 269-271. Part 1 (top) features a rhythmic pattern with triplets. Part 2 (bottom) features notes and triplets.
- vib./obj. (Vibraphone/Organ):** Measures 269-271. Part 1 (top) features notes and triplets. Part 2 (bottom) features notes and triplets.
- sh. (Shofar):** Measures 269-271. Part 1 (top) is empty. Part 2 (bottom) features notes and triplets.
- sol. (Soprano Saxophone):** Measures 269-271. Part 1 (top) is empty. Part 2 (bottom) features notes and triplets.
- keyb. (Keyboard):** Measures 269-271. Part 1 (top) is empty. Part 2 (bottom) features notes and triplets.

272

b.fl.

b.cl.(B♭)

vln.

vlc.

perc.

vib./  
obj.

sh.

sol.

keyb.