Volleys of Light and Shadow
for chamber ensemble and electronic sound

Commande de l’Ircam-Centre Pompidou
Musique électronique réalisée dans les studios de l’Ircam
Musique électronique : Ben Hackbarth, Gilbert Nouno

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Program notes and recording excepts:
http://www.benhackbarth.com/vls

Full recording available at:
http://www.benhackbarth.com/vls/vls.mp3
### INSTRUMENTATION

- **Flute/Piccolo**
- **2 Bb Clarinets**
- **Contra-Bassoon/Bassoon**
- **2 Bb Trumpets**
- **Trombone**
- **2 Percussion**
- **2 Violins**
- **Viola**
- **Cello**
- **Bass**

### STAGE PLACEMENT

#### PERCUSSION INSTRUMENTS

- **Percussion 1**
  - Vibraphone
  - Unpitched bucket, tom4, tom2, snare, shaker, guiro, wb3, wb1, gong, anvil, slapstick, ratchet

- **Percussion 2**
  - Crotale
  - Unpitched bucket, tom3, tom1, snare, cyma, guiro, wb4, wb2, cabasa, can, slapstick, ratchet

**bucket**: a simple, large plastic bucket mounted on a drum stand and played on its back.

**tom1, tom2, tom3, tom4**: taken from a set of toms, ordered low to high. Each head is dampened with a small disc of material, making the sound duller and less resonant. For example, an additional drum head may be laid over each tom's membrane, making its sound more dull and less resonant.

**guiros**: do not have to match – e.g. may be made of different types of materials.

**wb1, wb2, wb3, wb4**: woodblocks, ordered low to high.

**gong**: small unpitched gong, lying flat on a table dampened by foam.

**cabasa**: perhaps mounted to the table top so that it is easily played by both hands and mallets.

**can**: a 2-4 liter tin can played on its back on a table dampened by foam.

**anvil**: on a table dampened by foam.

**slapsticks**: do not have to match – e.g. may be different sizes.

**ratchets**: do not have to match – e.g. may be different sizes / timbres.

### INTERPOLATE RHYTHM

This indication modifies the performance of written rhythms in a given passage such that brief accelerations and decelerations “blur” the changing speed of attacks. To the left is shown a short example. Underneath the symbolic notation are two rows of dots corresponding to individual note attacks. The first line of dots shows the normal performed rhythm. The second row of dots shows the desired result of the “interpolated rhythm” instruction. Such modifications essentially ensure that, rather than abrupt

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This text is a compilation of the information provided in the images and includes some additional explanations for clarity and context.
changes in speed, the speed of successive notes is continually modified to achieve a fluid, continuous result.

**DGLISS -** Glissandi notated with a dotted line indicate that the rate of pitch change is coupled to the changing amplitude of the note. Thus, louder dynamics result in a faster glissando speed while softer dynamics indicate a slower glissando. As dynamics change, the speed of glissando should change in tandem. Consider the following examples which illustrate this coupling:

1. A static amplitude yields an even glissando, equivalent to an ordinary glissando.

![Image](image1.png)

2. However, a change in dynamic affects the slope of the glissando. In this case, the dynamic increase from p to mf create a steeper pitch change towards the end of the note.

![Image](image2.png)

3. The slope of the change in dynamic affects the slope of the glissando. Here, the exponential hairpin creates a more dramatic pitch change when compared to 2.

![Image](image3.png)

4. The intensity of dynamic change also affects the intensity of the glissando speed. A change from p – mp only creates a slight change in glissando slope...

![Image](image4.png)

5. while a change from p to mf yields a more dramatic slope in pitch change when compared to 4.

![Image](image5.png)

6. Any change in amplitude, however slight, affects glissando speed. Shown here, an accent.

![Image](image6.png)

Consider a more complete passage utilizing this notation:

![Image](image7.png)

**WIND TECHNIQUES**

- An unpitched noise made by blowing through the instrument while fingering the indicated note. By default, exhaling.

- Exhale.

- Inhale.

**FLUTE-SPECIFIC TECHNIQUES**

- Tongue Pizzicato. By default, articulated with a 't' syllable, but also performable with 'p' or 'ts' if indicated. Written duration is insignificant.

- Cover embouchure hole completely with lips, exhaling (by default) or inhaling (if indicated) into the instrument.

- Indicates a tremolo articulation method: d.t. = double tongue as fast as possible. flt. = flutter tongue. By default, flutter.

**CLARINET-SPECIFIC TECHNIQUES**

- Slap tongue. Written duration is insignificant.

- Constricted oral cavity.
BASSOON-SPECIFIC TECHNIQUES

\[ \text{ Slap tongue when reed is removed. Written duration is insignificant.} \]

STRING TECHNIQUES

\[ \text{ Mute strings with left hand resulting in a mostly unpitched sound. The left hand pressure is relatively hard while the bow pressure is relatively light. When this notehead is used, register corresponds to vertical bow placement – higher notes are closer to the bridge, lower notes are over the fingerboard. Left hand placement should also be used to sharpen registral differences. Clef is insignificant.} \]

\[ \text{ Indicates vertical bow movement towards the fingerboard (low) and towards the bridge (higher).} \]

\[ \text{ Scratch Tone – high pressure and slow bow speed. Use left-hand muting to avoid pitched resonances.} \]

\[ \text{ Slow bow} \]

\[ \text{ Unmetered jeté. Grace notes indicate approximate number of iterations and bounce speed with note durations (eighth, sixteenth, etc.).} \]

\[ \text{ Harmonic pressure.} \]

\[ \text{ Col Lengo Battuto, played by bouncing the wood of the bow against the string(s). Almost always with a muted notehead.} \]

\[ \text{ Accompanying a scratch tone, indicating to moving the location of the bow on the string towards or away from the fingerboard.} \]

\[ \text{ Accompanying a scratch tone signifying a slow rate of motion yielding intermittent and non-continuous impulses.} \]

\[ \text{ Forcefully slap the strings on the fingerboard with the left hand.} \]

\[ \text{ A snap “bartok” pizzicato.} \]

DOUBLE-BASS TECHNIQUES

Unlike the other string parts, all double bass harmonics are notated by indicating the desired pitch, not the string to play and the node to touch. The bass player should find the string and node which best suit the musical context. All harmonics notated in treble clef are written at sounding pitch.

TRUMPET TECHNIQUES

\[ \text{ An unpitched noise made by blowing through the instrument while fingering the written pitch. By default, exhaling.} \]

\[ \text{ Slap tongue. Written duration is insignificant.} \]

\[ \text{ Pedal tone, pitch is unstable.} \]

\[ \text{ An unpitched air sound that emanates from the removed 2nd valve slide, not the bell.} \]

\[ \text{ Percussive sound made by slapping the palm of the hand against the mouthpiece or leadpipe (removing the mouthpiece if desired).} \]

\[ \text{ Stop sustained note with tongue, producing a slight accent and a slight disruption to the timbre.} \]

TROMBONE TECHNIQUES

\[ \text{ An unpitched noise made by blowing through the instrument in the position of the written pitch. By default, exhaling.} \]

\[ \text{ Slap tongue. Written duration is insignificant.} \]

\[ \text{ A un-metered trill produced with the valve.} \]

\[ \text{ Pedal tone, pitch is unstable and unfocused.} \]

\[ \text{ Percussive sound made by slapping the palm of the hand against the mouthpiece or leadpipe (you may remove the mouthpiece if desired).} \]

\[ \text{ A wavering, pinched, unfocused, high-pitch that freely wanders between several overtones while keeping the same slide position.} \]

\[ \text{ Stop sustained note with tongue, producing a slight accent and a slight disruption to the timbre.} \]

PERCUSSION TECHNIQUES

\[ \text{ Staccato performed as a deadstroke.} \]

\[ \text{ Play with the shaft of the mallet.} \]

\[ \text{ An arrow across the note stem indicates a scraping motion.} \]

\[ \text{ Rimshot.} \]
brass – Indicates to play with the tip of a brass mallet. Or triangle beater, where appropriate.

– This clef is used to indicate what part of the shaft of the mallet makes contact with the instrument. Gradual changes across time, indicated with horizontal lines, should result in an audible change in timbre.

– Slurs are used exclusively to indicate a metered jeté. Most often written to be played with the shaft of the mallet, as shown to the left.

– Unmetered jeté. Grace notes indicate approximate number of iterations and bounce speed with note durations (eighth, sixteenth, etc.).

– A two-note quasi-jeté, where the second note is deadsticked and abruptly stops the resonance of the first.

– A dashed slur indicates a single gesture where the attacking implement (first note) remains depressed and the release (second note) is created from an energetic and noisy gesture scraping the articulative implement off of the instrument.

– A tremolo produced with the stick in contact with the instrument – after the initial attack, the stick should not leave the surface. The tremolo is created by rapidly moving the stick back-and-forth across a small area. Accents and dynamics are created by expanding/contacting the area, changing the size of the motion. In an unmetered tremolo, as fast as possible. If repeated attacks, each note is a single motion.

– Make circular motions of the object with the specified implement. The implement should remain in contact with the surface of the playing object over the course of the note’s duration. In an unmetered tremolo, as fast as possible. If repeated attacks, each note is a single circular motion.

ELECTRONIC PERFORMANCE

The electronic part is realized with a Max/MSP patch available from IRCAM. The spatialization algorithms in the patch may be configured to reproduce the electronic part for any number of loudspeakers. The minimum channel count is 2.1 – configurations up to 24.2, including the use of elevated channels, have been tested. It is important to note that subwoofer channels are supplied by the patch and should not be summed at the console due to delay-based panning algorithms.

Depending on the size of the hall, slight amplification may be used on select players in order to boost the overall level to meet that of the electronics.

ELECTRONIC NOTATION

Electronic sounds are notated on an 18 line staff where the middle space corresponds to middle C. Contrary to typical Western notation, the interval between any adjacent line-space or space-line is a semitone. Thus, the staff’s top line corresponds to F5 (the normative top line of the treble clef) and the bottom to G3 (the normative bottom line of the bass clef).

Events are shown in a “piano-roll” type notation which is synchronized to the acoustic score. Pinched electronic events are notated according to their time-varying fundamental frequency. Unpitched sounds are notated according to a time-varying measure of the distribution spectral energy. Amplitude is shown with both note thickness and darkness.

THANK YOU

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Violent, torn-off gestures.

Violin 1

Violin 2

Viola

Cello

Double Bass

Clavier

RH: audible sfz
LH: inaudible synchronization

Violin, von-olf gezogene
Each note changes slightly...
Make the difference between soft and loud extreme and unpredictable.
Accented attacks drift slightly sharp.

ord. arco

Pizz

Nail

Glissando on II while playing I
Should not produce distinct harmonic pitches - rather, an airy and noisy sound.

Dynamics are prescriptive of effort - result will be softer than written.

The speed of the tremoli get faster as dynamic increases.

Light, feathery, fluid tremoli.

RH: audible pizzicati
LH: inaudible synchronization
Sustained, dramatic changes in intensity which fuse together to create a singular harmonic object. Dynamic changes must be very precise and, at times, impossibly soft.

Time is placed loosely on top of the bar to create a new, barely visible.
Each note is a separate pizzicato chord
The feel of the music changes suddenly here. The character of individual instruments prevail.
Gliss continuously over this entire passage.
Note changes are smooth and uneventful—do not attack pitches with tongue.

**Picc**

**Cl 1**

**Cl 2**

**Cbsn**

**Tpt 1**

**Tpt 2**

**Tbn**

**Perc 1**

**Perc 1**

**Vln 1**

**Vln 2**

**Vla**

**Vc**

**Db**

**Clv.**

**Open**

**Jete**

**Shekere**

**Woodblock**

**Cunga**

**Brass**

**Triangle**
Pic.

Cl

B. Cl.

Bsn.

Tpt 1

Tpt 2

Tbc

Crot

Vln 1

Vln 2

Vla

Vc

Db

Ch.
Contour is more important than the audibility of particular pitches.

Successive glissandi are integrated into single, fluid gestures.

Contour is more important than the audibility of particular pitches.
Successive glissandi are integrated into single, fluid gestures.
Mostly unpitched and noisy.
Despite the different systems of notating rhythm, try to make the following phrases sound like one continuous gesture.