

Philippe Manoury

*K...*

2001

Portage to Max 5 - 2009  
2009



---

The setup and the execution of the electroacoustic part  
of this work requires a Computer Music Designer (Max expert).

---

## Table of Contents

Table of Contents	2
Work related information	3
Performance details	3
Detailed staff	3
Realisation	3
Useful links on Brahms	3
Version related information	4
Documentalist	4
Realisation	4
Upgrade Motivation	4
Comment	4
Other version(s)	4
Electronic equipment list	5
Computer Music Equipment	5
Audio Equipment	5
Files	6
Instructions	7
Audio setup	7
Loudspeaker setup	7
Midi setup	9
Software installation	10
Initialization routine	10
Rehearsal	11
Patch presentation	11
Matrix presentation	11
Midi Mixer view	12
Faders views related to synthesis and processings	12
Synthesis and Processing techniques	13
Spatialization using SPAT (IRCAM)	20
Spatial Trajectories	21
Qlists	24
Troubleshooting	26
The PROLOGUE - excerpt from the Opéra	26

## Work related information

---

### Performance details

- March 7, 2001, Paris, Opéra National de Paris

Publisher : Durand

### Detailed staff

- soloists: 2 solo sopranos, solo mezzo-soprano, 5 solo tenors, 4 solo baritones, solo bass voice
- 3 flutes (also 1 piccolo), 3 oboes (also 1 English horn), 3 clarinets (also 1 E-flat clarinet, 1 bass clarinet), 3 bassoons (also 1 contrabassoon), 4 horns, 4 trumpets (also 1 flugelhorn), 3 trombones, tuba, 3 percussionists, 4 timpani, 2 harp, piano (also electronic/MIDI keyboard/synthesizer), celesta, 14 violins, 12 second violins, 10 violas, 8 cellos, 6 double basses

### Realisation

- Serge Lemouton

### Useful links on Brahms

- [K...](#) opera in twelve scenes, for solo voices, orchestra and live electronics (2000-2001), 1h20mn
- [Philippe Manoury](#)

## Version related information

---

Documentation date: June 8, 2009

Version state: valid, validation date : May 3, 2018, update : May 6, 2021, 3:10 p.m.

### Documentalist

Carlo Laurenzi (Carlo.Laurenzi@ircam.fr)

You noticed a mistake in this documentation or you were really happy to use it? Send us feedback!

### Realisation

- Serge Lemouton (Computer Music Designer)
- Carlo Laurenzi (Computer Music Designer)

Version length: 1 h 41 mn

Default work length: 1 h 20 mn

### Upgrade Motivation

This version of "K..." is a Max Msp 5 upgrade of the original 2001 JMax patch.

The Opéra was premiered at the Opéra Bastille in Paris in 2001, then played again, still at Bastille, in 2003. At the time, two powerful SGI (Silicon Graphics) computers were needed, while today a single MacBookPro 2.33 Ghz can run the entire Max 5 patch.

### Comment

The electronic equipment list has also been updated to newer technologies.

### Other version(s)

- [Philippe Manoury - K... - transfert\\_mustica\\_ftp](#) (April 14, 2010)

## Electronic equipment list

### Computer Music Equipment

- 1 MacBook Pro - *Apple Laptops* (Apple)  
Minimum Requirements: Core 2 duo 2.33Ghz, 2 Gb Ram, HD 7200 rpm
- 1 network - *Network/Communication*  
Fiber Optic System, to pass midi data from the midi keyboard in the orchestra pit to the Fireface 800 soundcard
- 1 Max/MSP - *Max* (Cycling74)  
version 5
- 1 Fireface 800 - *Sound Board* (RME)
- 2 KX 88 - *MIDI Keyboard* (Yamaha)  
Midi Keyboard
- 1 BCF 2000 - *MIDI Mixer* (Behringer)  
Midi Mixer
- 2 Studio +2 - *MIDI Interfaces* (Opcode)  
Midi to Optical translator
- 2 Booster - *Booster*  
Midi Booster

### Audio Equipment

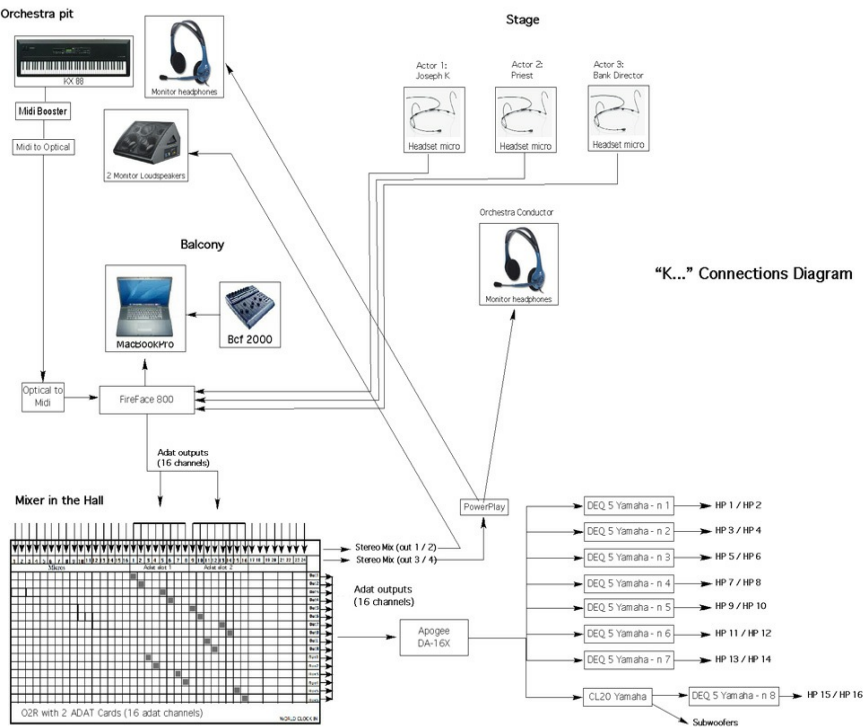
- 4 Dynamic microphone - *Dynamic Microphones*  
4 Condenser microphones
- 3 DPA 4065 - *Condenser Microphones* (DPA)  
Microphone for the 3 main actors onstage
- 1 POWERPLAY PRO-XL HA4700 - *Headphone Amplifier* (Behringer)
- 16 Loudspeaker - *Loudspeakers*  
16 Channels loudspeakers system
- 1 Loudspeaker - *Loudspeakers*  
2 loudspeakers (monitors) for the keyboard player and orchestra (in the orchestra pit)
- 1 DA-16X - *Digital Converters* (Apogee)  
Digital to Analog converters (16 channels)
- 1 DM2000 - *Digital Mixers* (Yamaha)  
With 2 ADAT cards (+ 16 channels digital inputs / outputs)
- 1 C20 - *Effects Processor* (Yamaha)  
Digital Crossover
- 8 DEQ5 - *Equalizers* (Yamaha)  
Graphic / Parametric 30 band Stereo output Equalizer

Files

File	Type	Author(s)	Comment
<a href="#">K-MAX5.dmg</a>	Patch		
<a href="#">K Prologue - 8 piste.dmg</a>	Recording(s)		Prologue - 8 tracks
<a href="#">P Manoury - K - 2009 enregistrements.dmg</a>	Recording(s)		recording of Prologue and Scene 9 (electronics only)

Instructions

Audio setup



Connections diagram

Loudspeaker setup

<b>IRCAM</b> <small>Centre de Recherche et de Création          Institut de Recherche et de Coordination Musicales</small>	
plan n°100	K ...
dances : 2/03/2001	Bastille
Elyse David Pissarowski & Tel : 01 44 78 15 57 Fax : 01 44 78 15 40 <a href="mailto:pissarows@ircam.fr">pissarows@ircam.fr</a>	

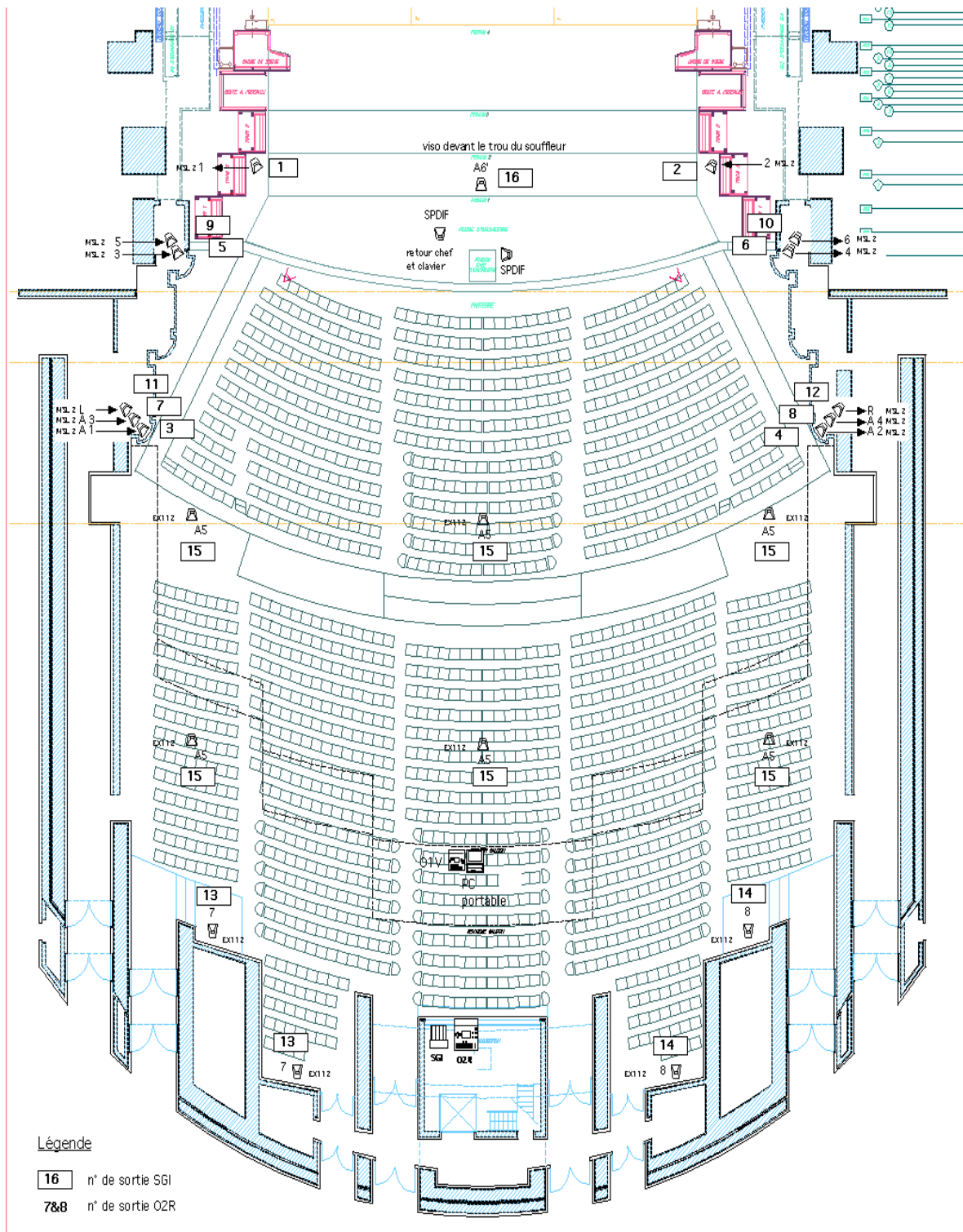
K...

Opéra de Philippe Manoury

## UPA dans le décor

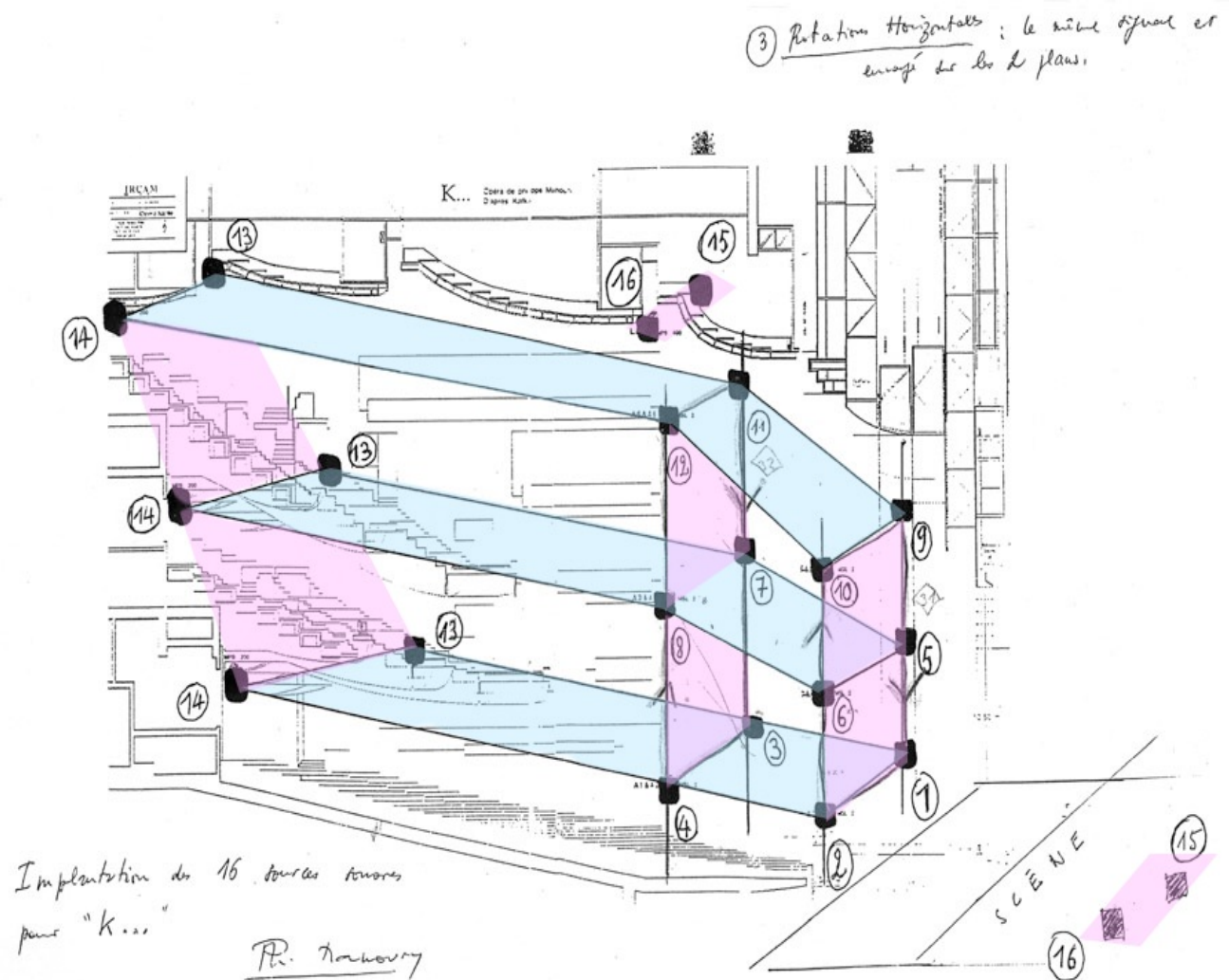
A6

16



### Concert Hall map with Loudspeakers System Setup

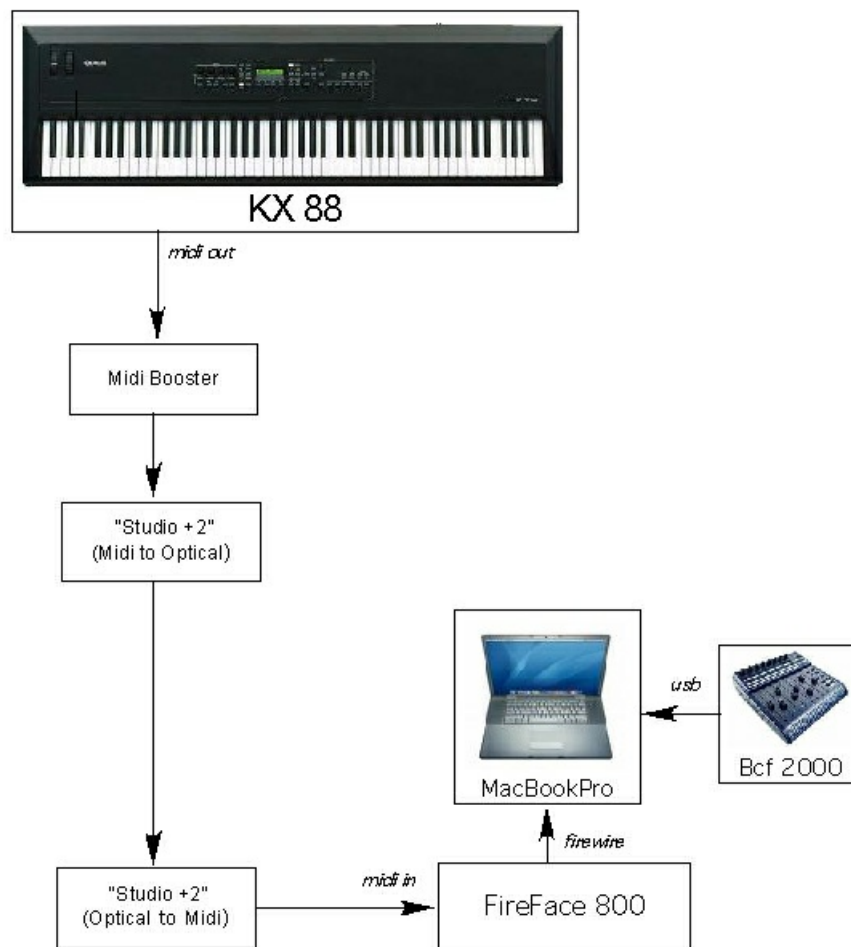




Drawing made by Manoury showing the implementation of the 16 channels sound system

The 16 channels sound system setup is thought as a combination of both three horizontal layers (top, middle, bottom) and three vertical layers (front, middle, back), plus two couples of extensions, towards the ceiling and beyond the front. Three Spat~ (Ircam) modules (together or one by one) are used for spatialization. Furthermore, a panning system is used to perform several kinds of trajectories along the channels system's structure.

## Midi setup



#### Midi Setup:

Mixer Midi -> assign port "a"

Midi Keyboard -> assign port "b"

#### Midi Channels:

Mixer midi: ch 1 to 8

Midi Keyboard: ch 9

### Software installation

Open Max "File Preferences" panel and add a new path to the folder "K-MAX5".

Look into "Externals" folder. All the externals in that folder must be installed (if they haven't already been installed before).

DSP Status: I/O Vector Size 512 ; Signal Vector Size 64

Max Scheduler "Overdrive" and "Audio Interrupt", must both be turned ON.

--- CPU Load on a MacBookPro 2.33 Ghz, 2Gb ram, 100 Gb Hd 7200 rpm, Osx 10.4.11, Spat 3.4.11 : 48% ---

### Initialization routine

Open "Ksyn10.maxpat"

Click on "INIT", then press "0" (initial scene number)

Turn on the DAC.

The first note from the keyboard player's score will trigger the starting of the piece.

## Rehearsal

During rehearsals, use the "Goto" automatic system to scroll through the different Events of a single Scene.

To rehearse every Scene from the beginning, first click INIT, then click on the number of the scene to rehearse. The keyboard player will trigger the starting of the scene.

To skip events (one by one), press the space bar.

To reset the patch, click "INIT".

## Patch presentation

**"K..."**  
Opéra de Philippe Manoury  
Réalisation Informatique Musicale: Serge Lemouton (IRCAM)

Start: INIT to initialize Patch, then click on "0"

**INIT** Scenes Recall  
0 1a 1b 1c 2 3 4 5a 6 7 9 11b 11c 11d 12

**p Scenes**

**s exp-nxtev**  
Trigger NEXT Event manually

**r exp-sectout**  
0  
current SCENE Number

**r exp-label**  
0  
current EVENT Number

**Event N. manual trigger**  
0  
**goto** Type Event number and Bang to set it.  
to be used when a manual fast access to a precise event of a certain Scene is necessary

**DAC Start - Stop**  
**p Keys**  
Press W (or lowest A on the Midi Keyboard) to start / stop DAC  
dac~

**Score Follower**  
On / Off  
**p Suivi**  
**p Qlists**

**Global Reset Control**  
**p Reset**

**Midi Mixer Control**  
**p MidiMix**

**Audio samples reading**  
**p Direct-to-disk**

**Input / Output**  
**p Entrees**  
**p Sorties**

**KSpAt - Ircam Spats Control**  
**p SPATs 1 - 2 - 3**

**Matrix Control + DSP units**  
**p Grand-Central**

**Opéra 16 Channel V-METER**  
**p 16 Channels Loudspeakers Configuration V-METER**

**synthese**  
Paf Faders view  
**p PAFs 1-4**  
**p PAFs 5-8**  
Paf data Management  
**p Data-Entry**  
**p Puf-ctl**  
Psola Data Control  
**p Psola**  
Other controls  
**p sections**  
**p Mute**  
**p Spatialization**

**sampling**  
Trevor Faders view  
**p Trevor1**  
**p Trevor2**  
Trevor Data Control  
**p Trevor-ctl**  
**p Samples**  
Trevor is a sampler (from T.Wishart)  
Orchestral Samples Faders view  
**p Samp-oscs**  
triggering of audio samples  
**patcher work**  
**patcher sketches**  
**p Rehearsal**  
**p HELP**

**traitements**  
Noise Faders view  
**p Noise**  
Reverb Faders view  
**p Reverb**  
Harmonizer Faders view  
**p Harm4**  
Freq Shift Faders view  
**p FShift**  
To Spats sends - Faders view  
**p ToSpats**  
Leslie data Management and Faders view  
**p Leslie**  
**p Configuration\_16**

**Output Channels**  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

\* Opéra Bastille premiere - 6 mars 2001 ; Ported Version for Max 5 - Mai 2009

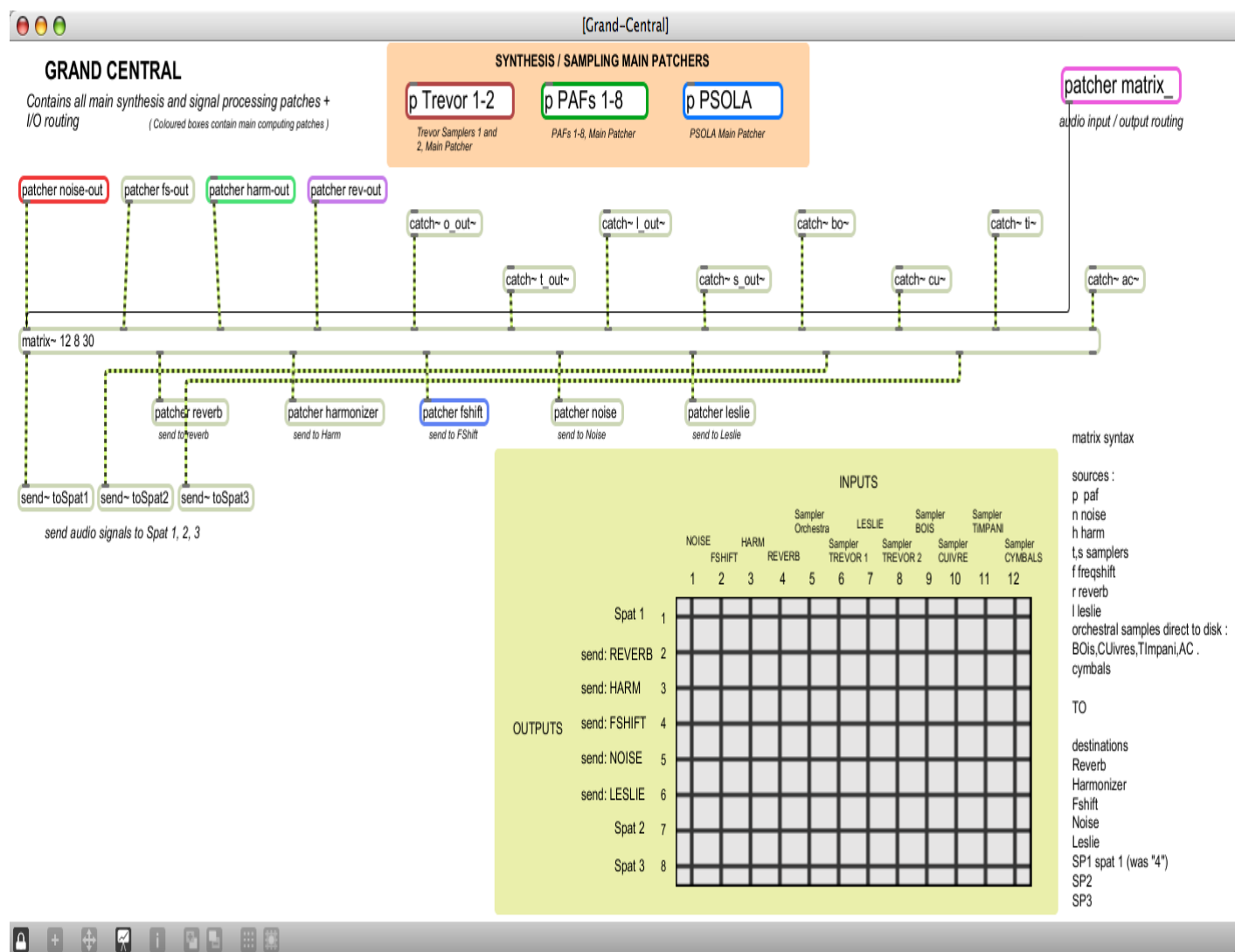
### Main Patch screenshot

The left half of the screen contains mainly subpatches dedicated to synthesis computing and audio processing (all the variously coloured boxes), while the right side contains mostly subpatches (green boxes) dedicated to faders views related to synthesis and processings.

Apart the 16 output channel v-meter on the right bottom side, there's another v-meter showing the configuration of the 16 channels system and their related levels (double click on "p 16 Channels Loudspeakers Configuration v-meter" green box).

The Patcher "Work" contains subpatches made by Manoury himself, most of them responsables for triggering of some soundfiles.

## Matrix presentation

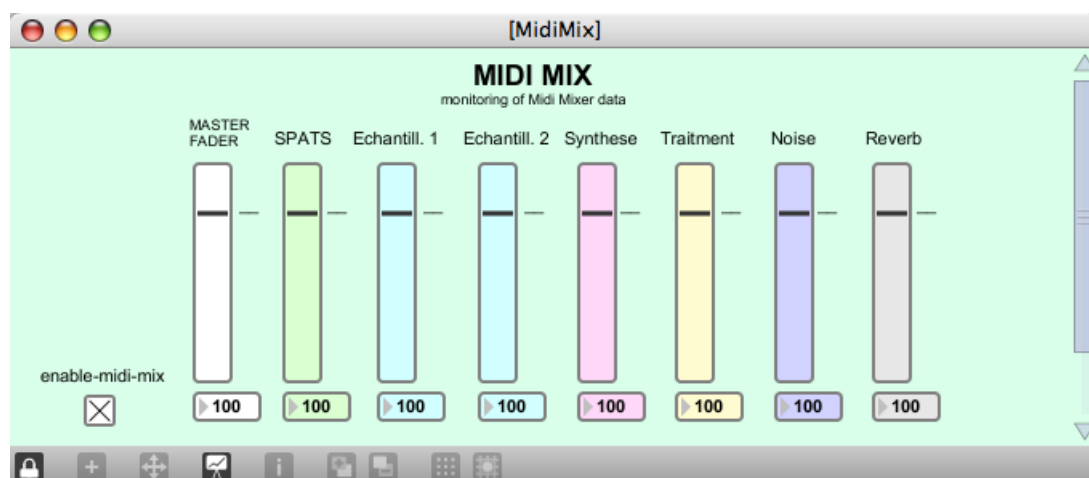


At the top center of the page there's an orange area which contains the main computing patchers for sampling (Trevor 1 and 2) and synthesis (PAFs 1-8 ; Psola).

At the bottom right, the matrix control.

In the middle, the coloured patchers boxes contain the main computing patches for some audio signal treatment (noise, reverb, harmonizer, pitchshifter, leslie).

## Midi Mixer view



Opening K main patch launches the "midi mix" window, which shows midi mixer's faders values.

## Faders views related to synthesis and processings

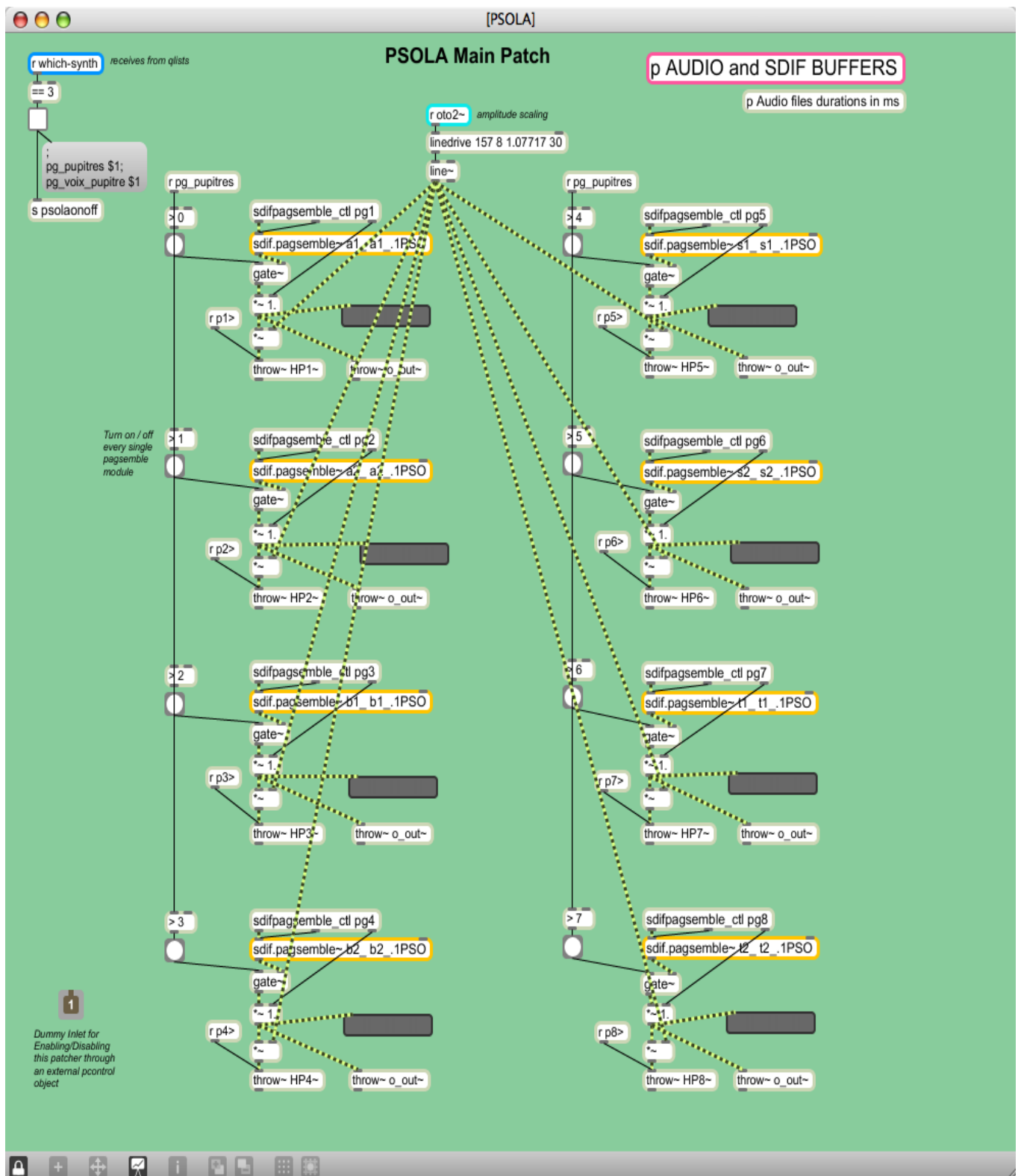


Inputs and outputs level, sends, transposition frequencies and all other parameters related to the harmonizer are shown.

## Synthesis and Processing techniques



In this version of K, the original Jmax external called "PmPaf~", especially created for Manoury, has been replaced with Miller Puckette's "Paf~" external. Moreover, Paf sounds are here enriched by a nonlinear distortion process based on a noise sample. (direct and distorted signals are independent)

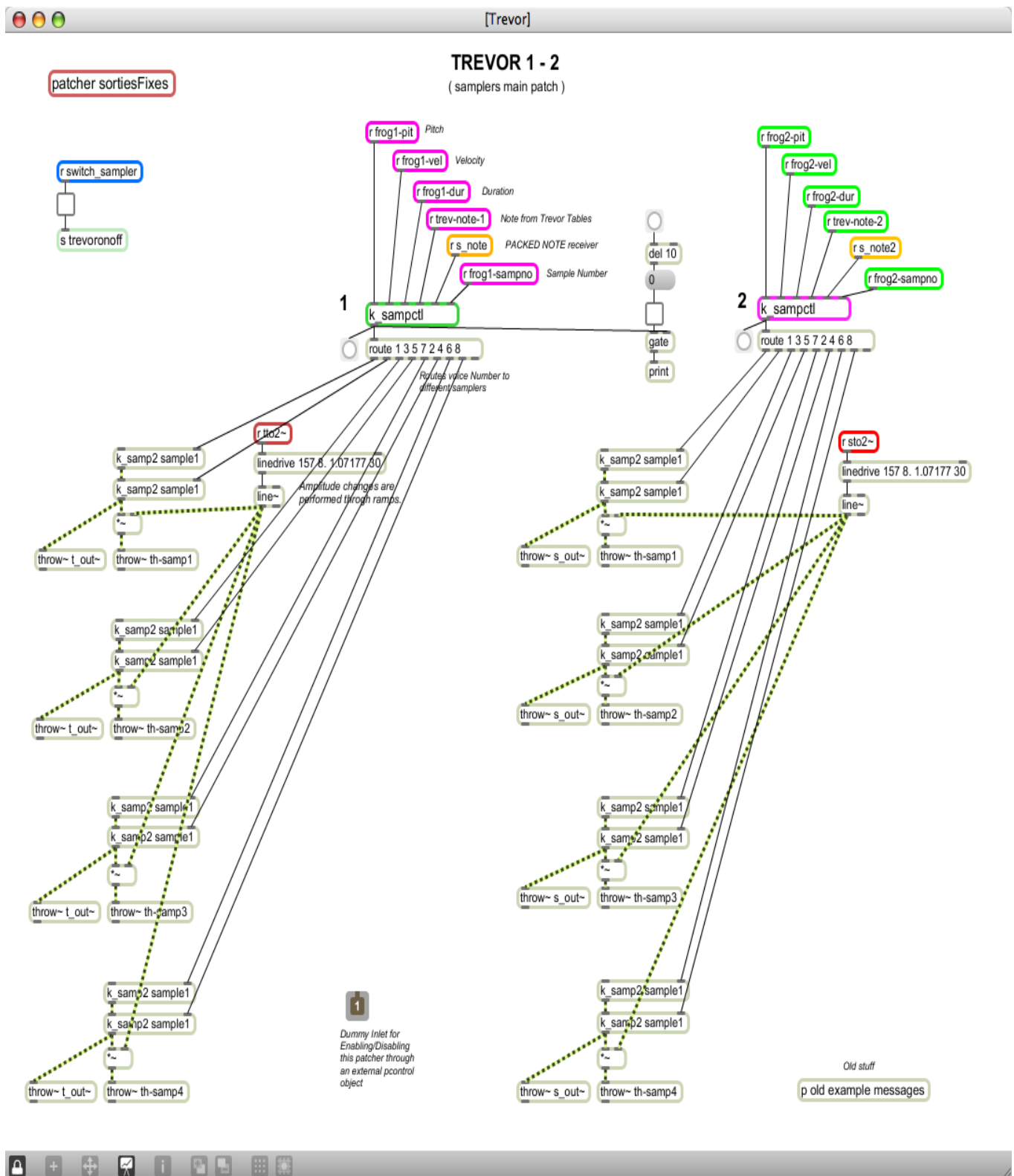


a screenshot of PSOLA (for choir synthesis) patcher

The original Jmax external for Psola based choir synthesis, "Psgroup~", has been replaced here by "sdif.pagsemble~", which reads 1PSO.sdif description files instead of .mat5 files (matlab).

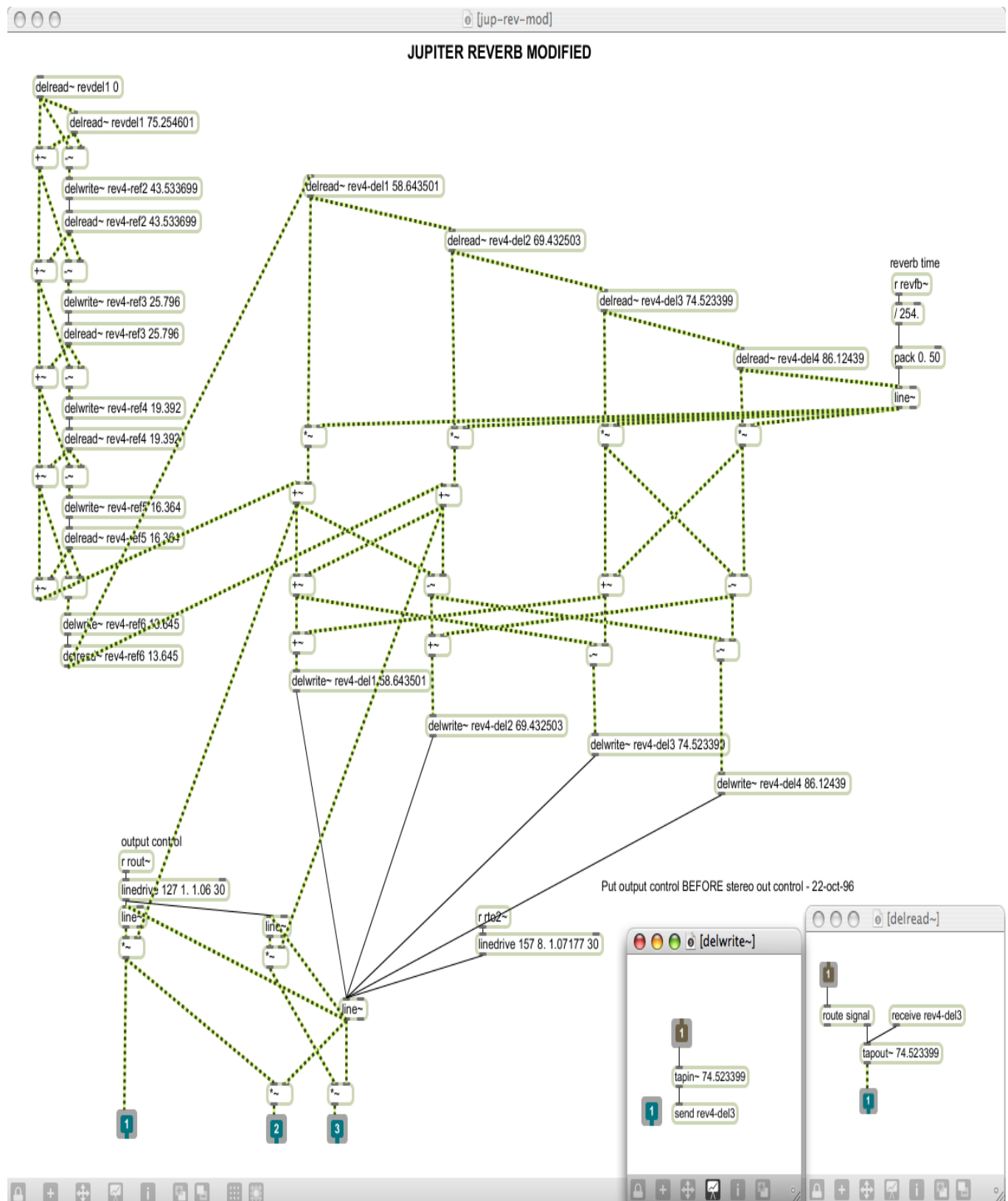
A sound example of a Choir synthesized with PSOLA (4 groups of 4 singers, synchronized)





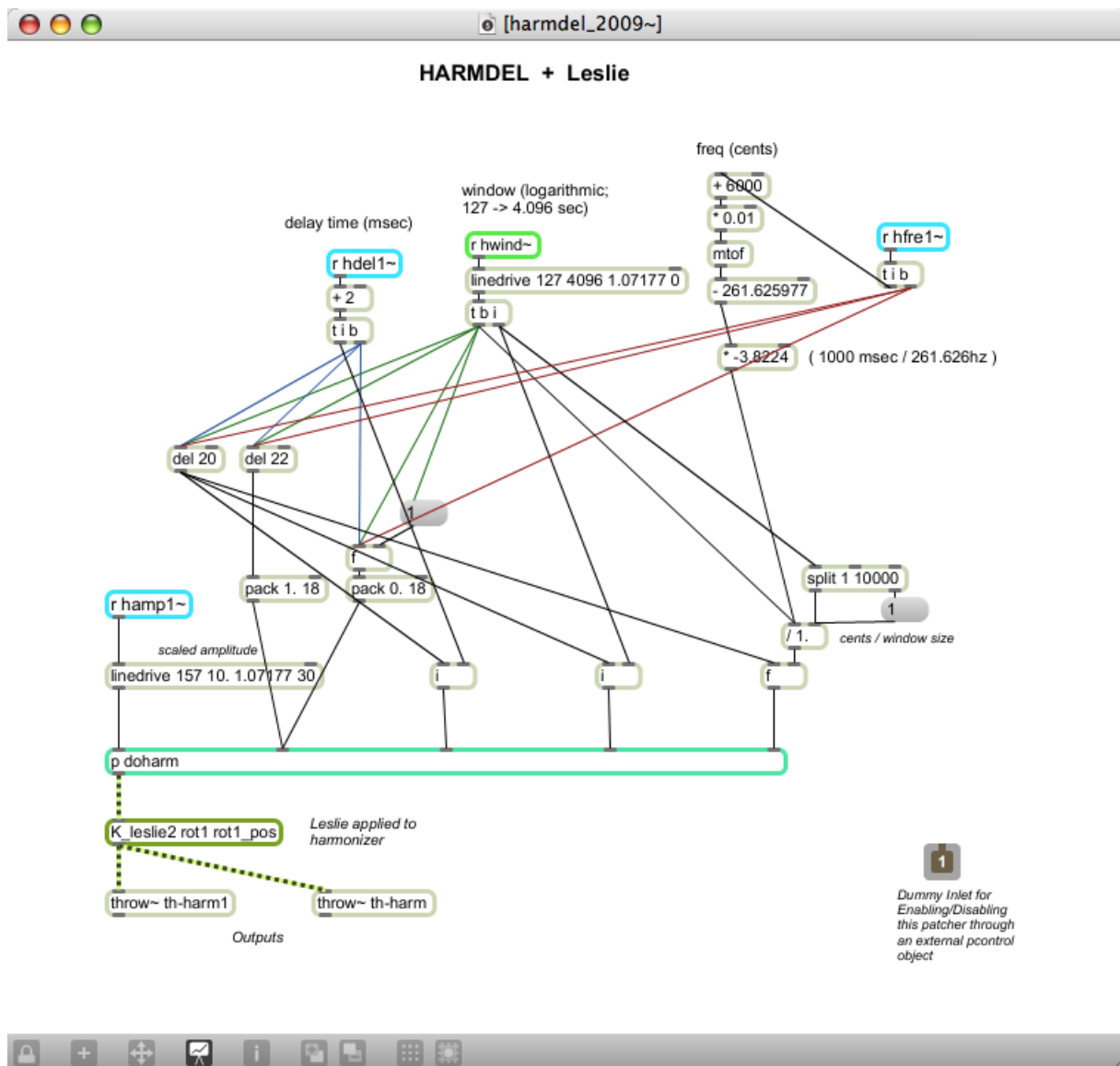
screenshot of sampling main patch (Trevor, from Trevor Wishart)

There are 2 sampling engines, Trevor 1 and Trevor 2. Each has a separate fader on the mixer midi.



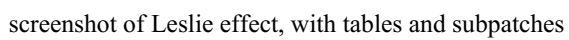
screenshot of the Reverberation algorithm used in "K...". It was previously used in Manoury's piece "Jupiter"

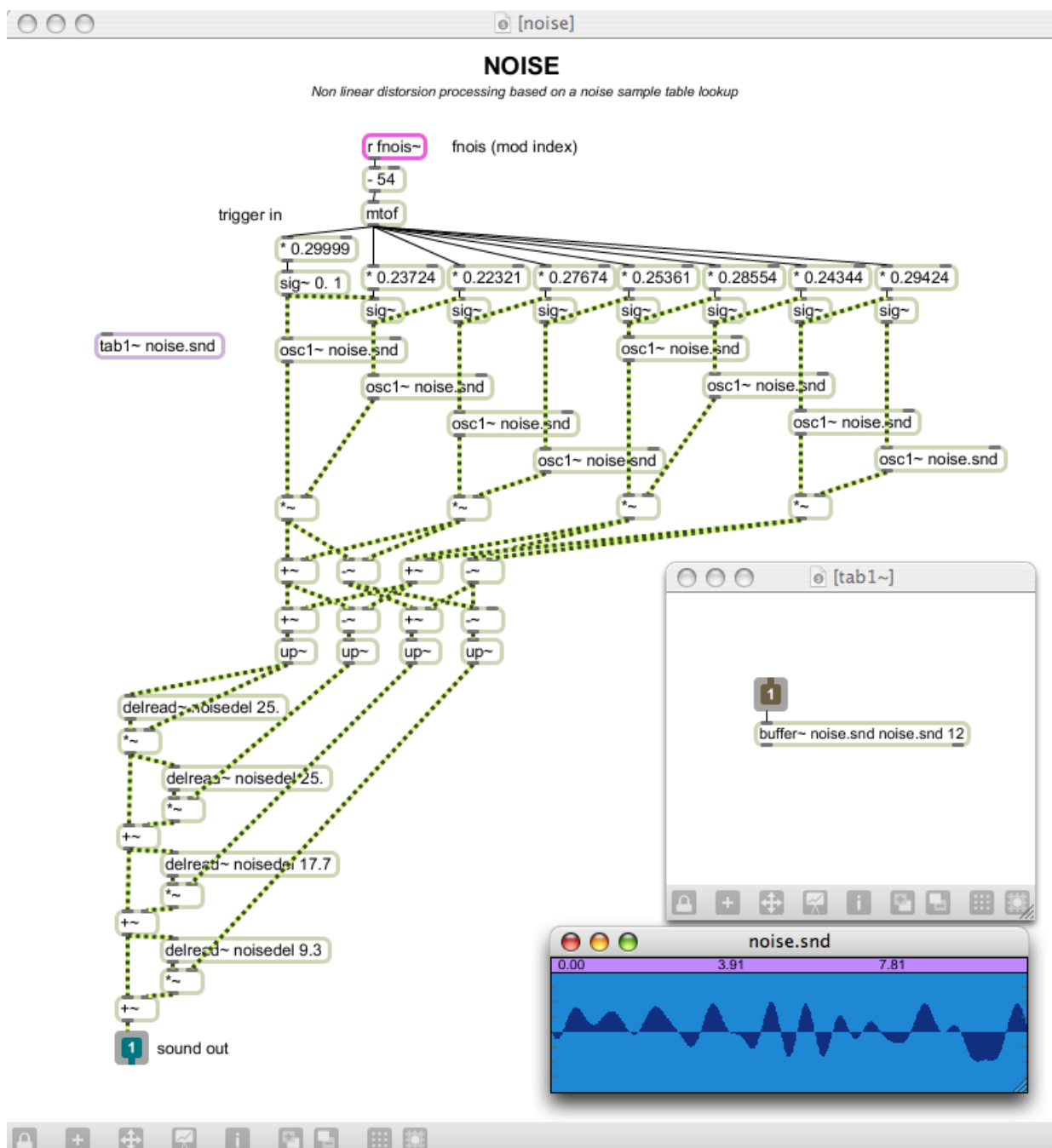




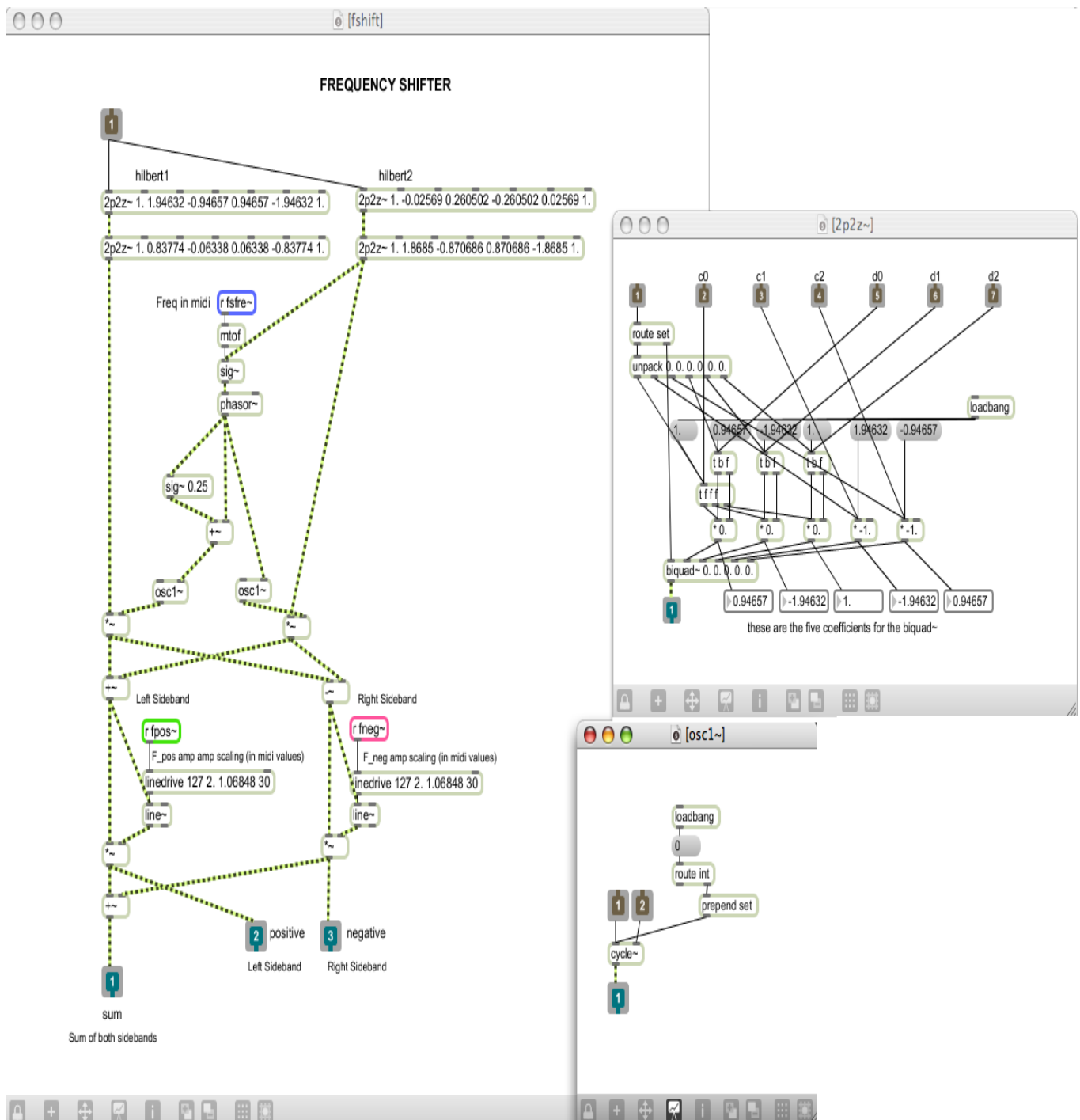
screenshot of Harmonizer main patcher

Delay audio processing is calculated by the harmonizer algorithm itself. A Leslie effect is applied at the end.



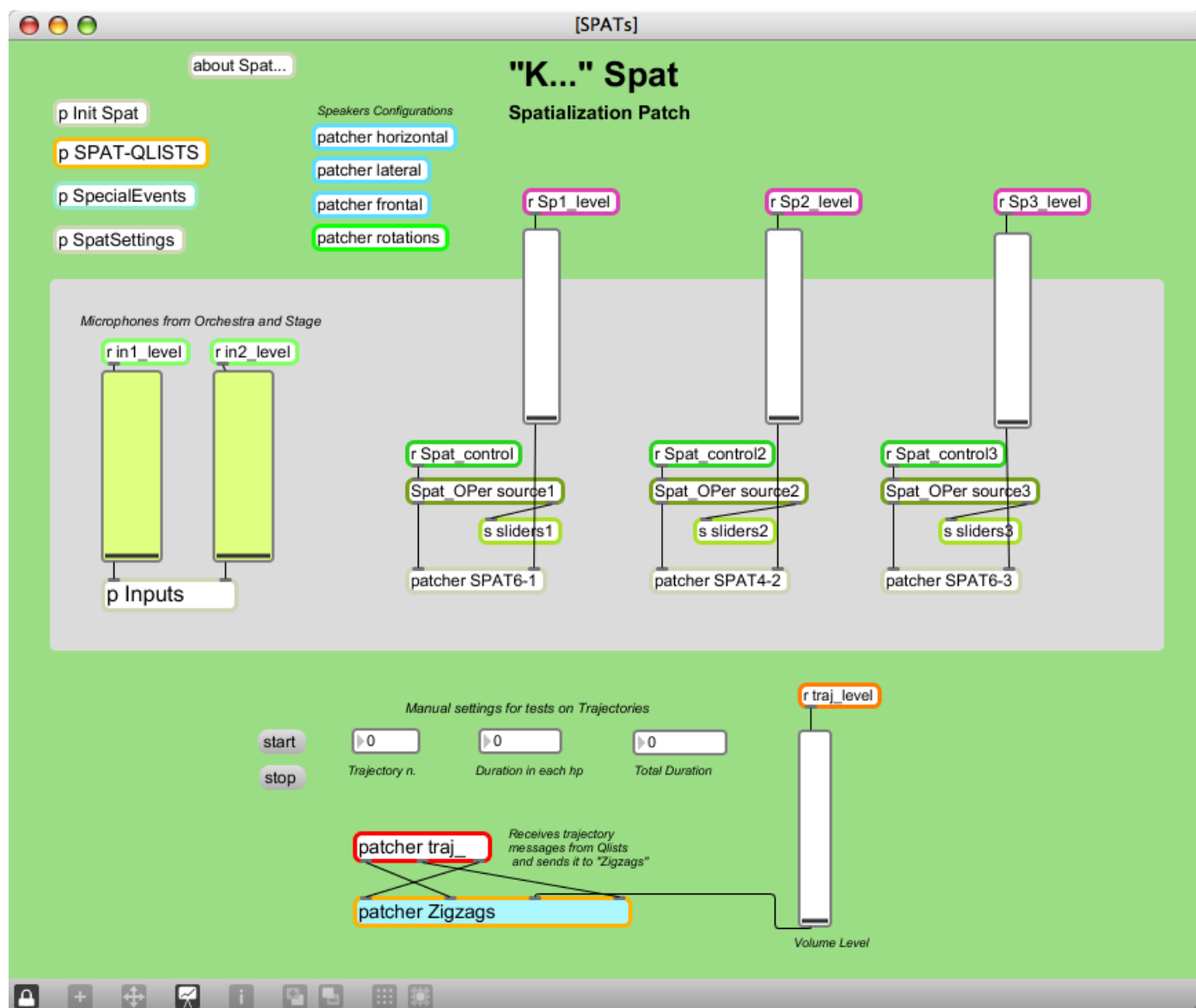


screenshot of non-linear distortion patch, based on a noise sample



screenshot of Frequency Shifter algorithm

## Spatialization using SPAT (IRCAM)



The SPATs patcher for K

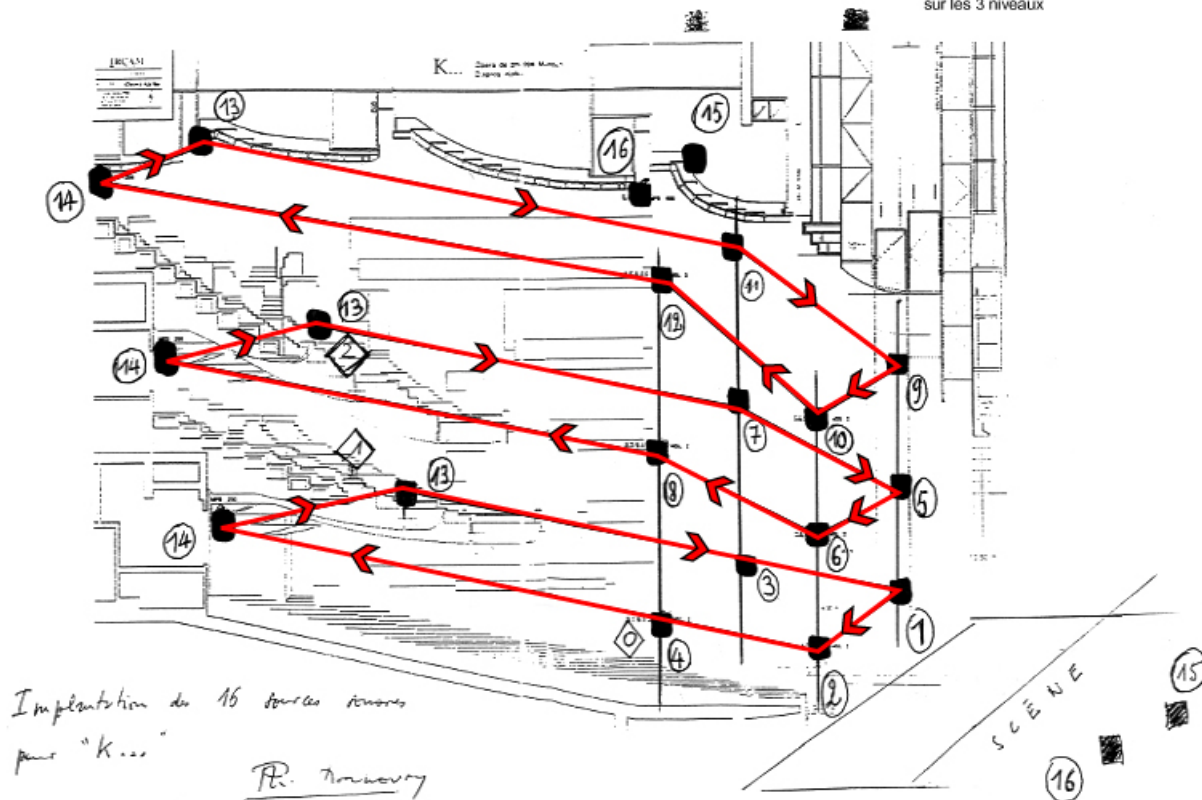
In 2001, this SPATs patcher had to be run on another machine (sync'ed with the main computer), because of its high cpu load. On the top half sends values for the three Spats (first has 6 chs, 2nd has 4 chs, third has 6 chs) and for the two stage inputs are shown. The bottom half contains the patchers implemented to perform trajectories along the 16 channels system structure. A Manual choice of trajectory number and partial / total durations is available for test purposes.

## Spatial Trajectories

During the Opéra, different kinds of spatial trajectories are performed along the 16 channels structure:

## 1 - Rotations Verticales

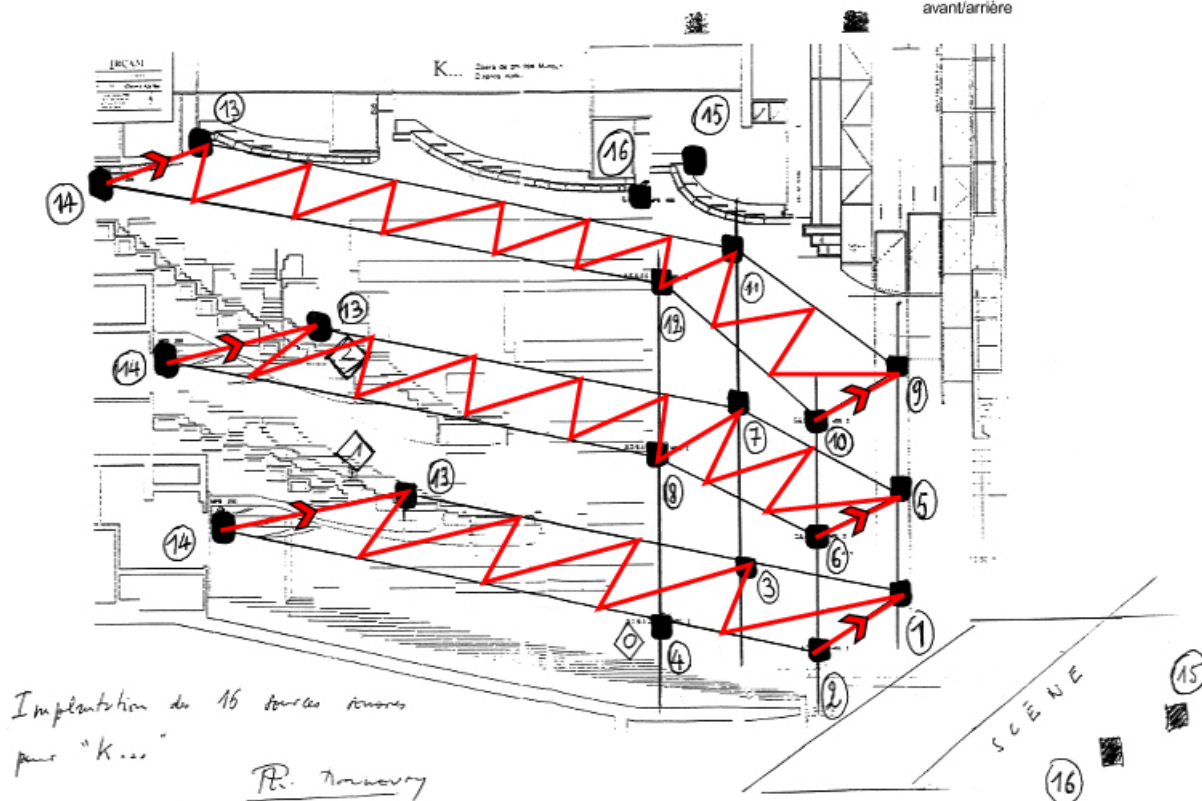
Le même signal est envoyé  
sur les 3 niveaux



Rotations on the three horizontal planes (top, middle, bottom)

## 2 - Balayage Vertical

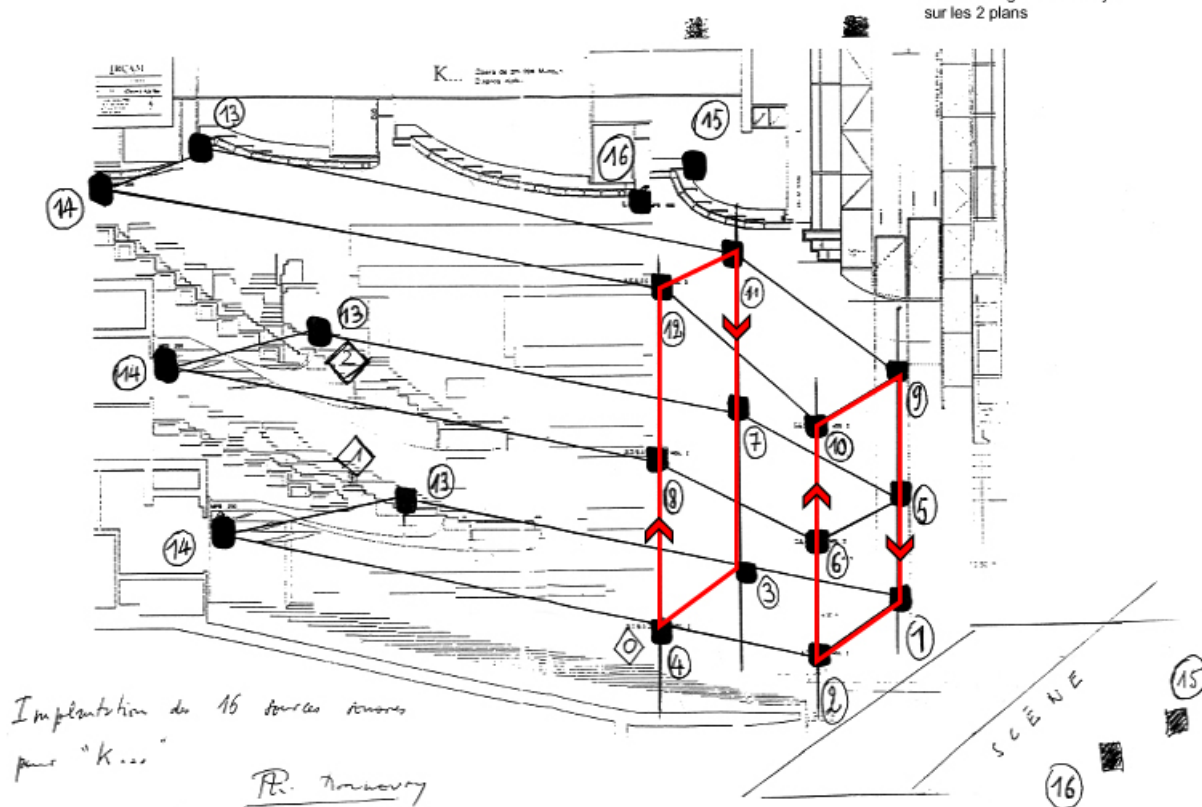
gauche/droite  
avant/arrière



Pingpong movements on the three different planes, at the same time, moving forward and backwards

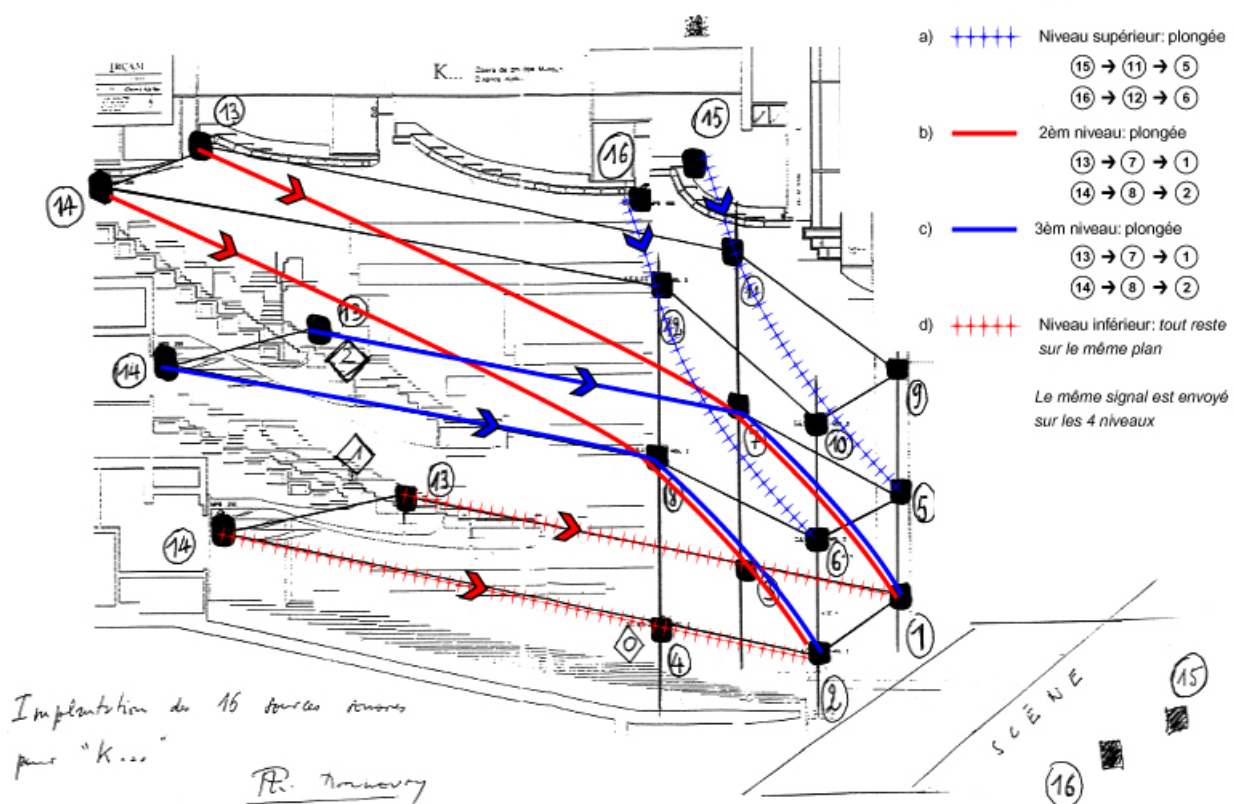
## 3 - Rotations Horizontales

Le même signal est envoyé  
sur les 2 plans



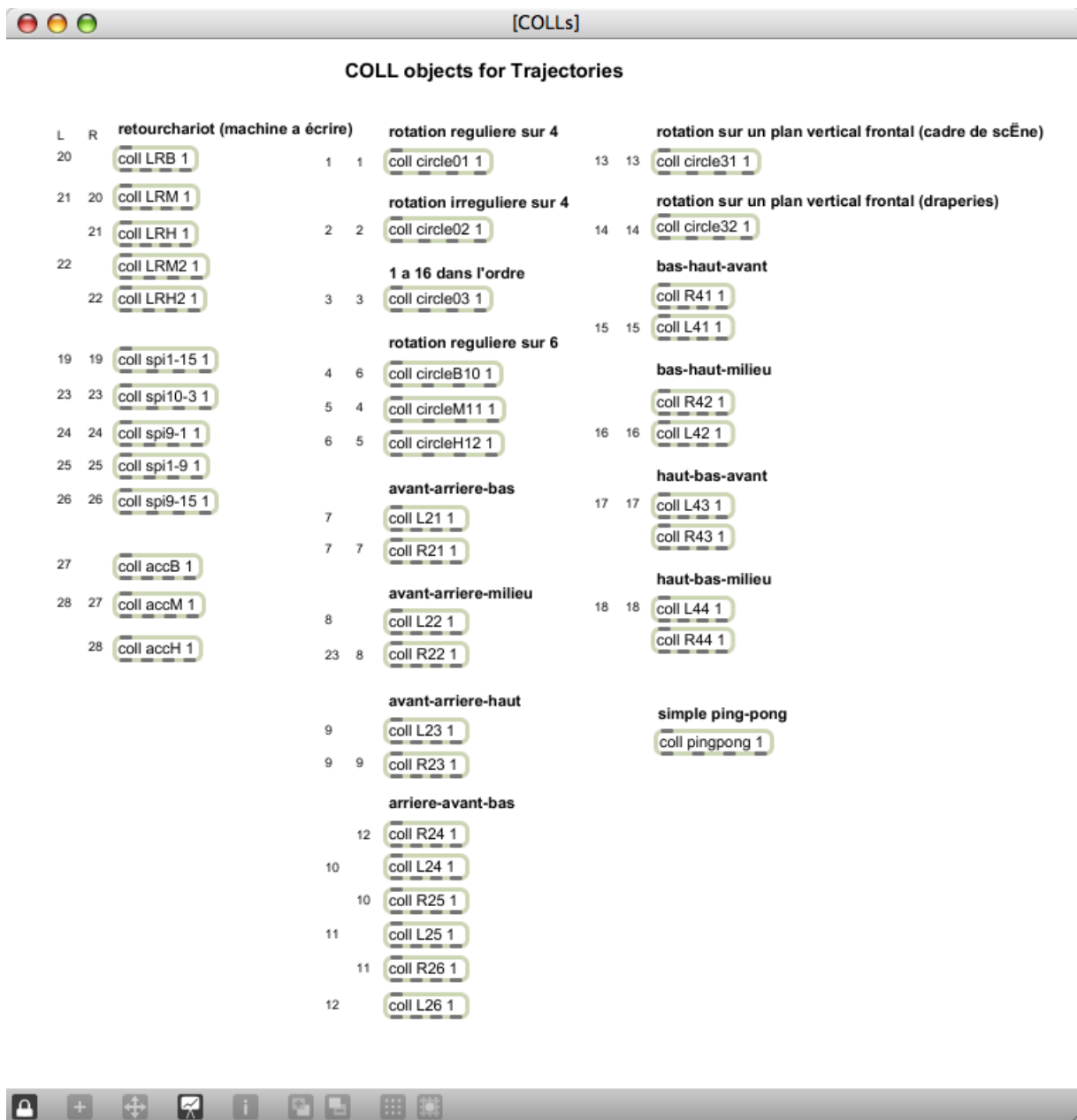
Rotations on the first two horizontal planes (front, middle)

## 5 - Trajet arrière → avant avec plongée



Trajectory on all planes at the same time, starting from the back to the front, with a final falling down towards the bottom of the stage





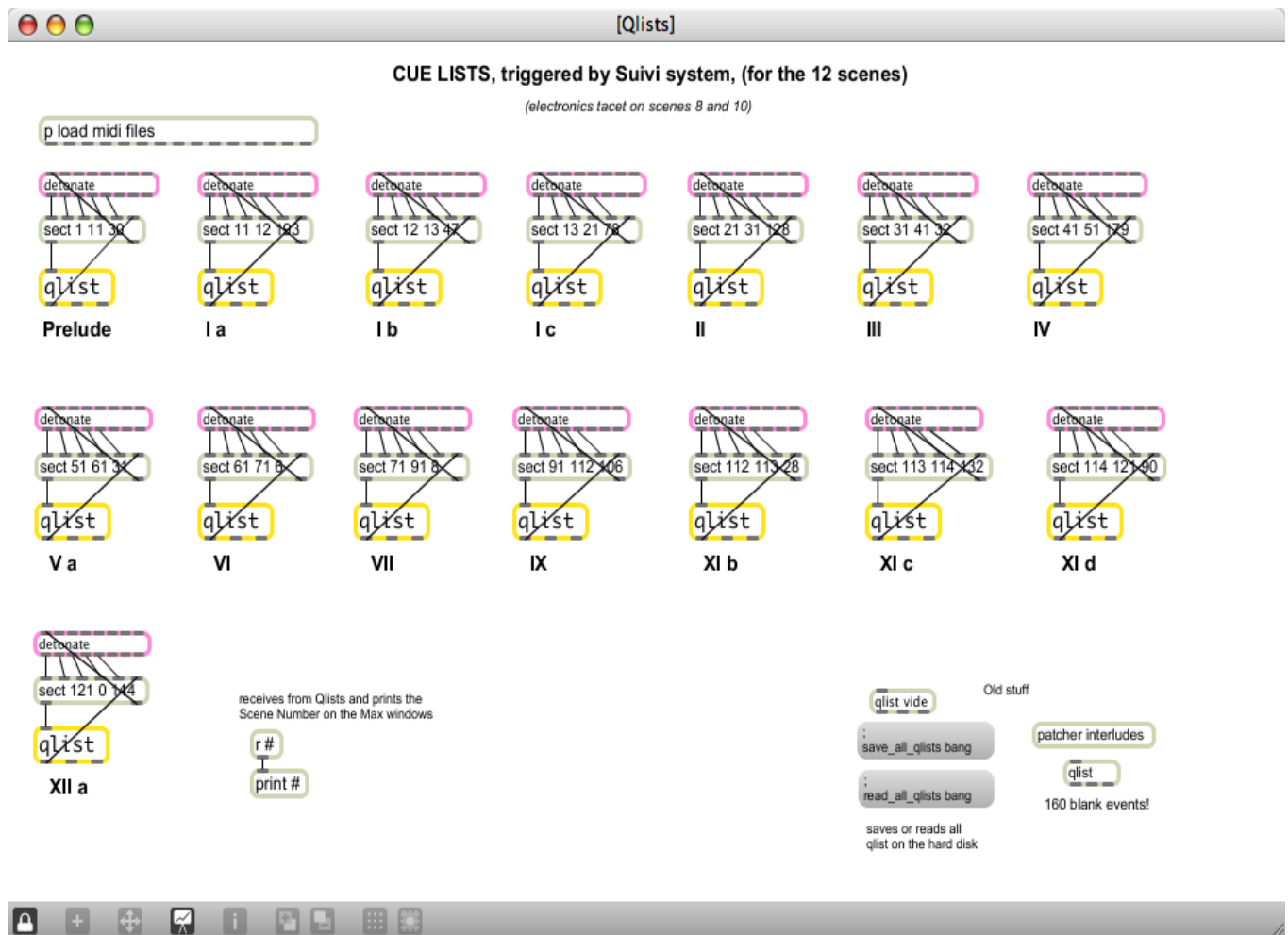
patcher containing the colls describing all the spatial trajectories implemented

## Qlists

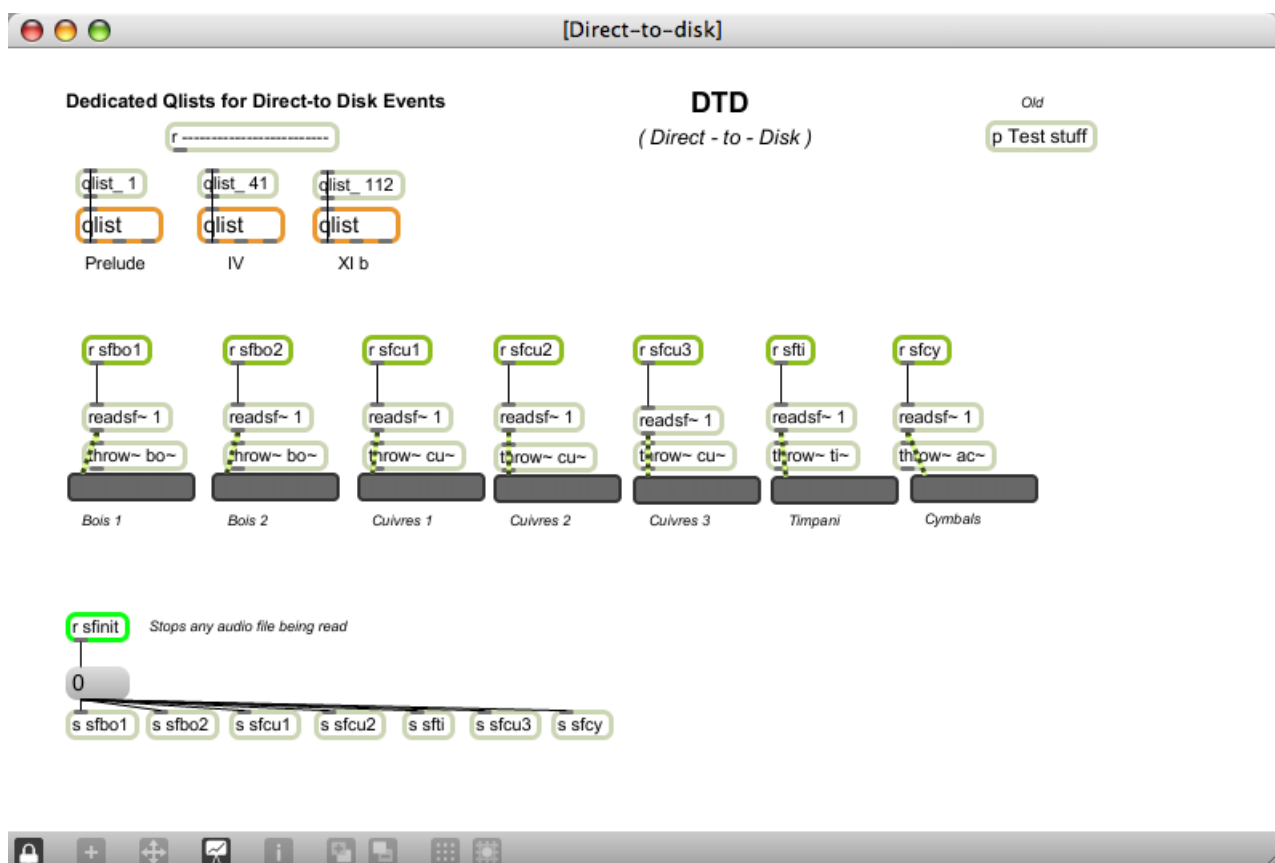
In "K..." 3 kinds of Qlists are used.

The **1st** for all **major Events and Scene changes**:

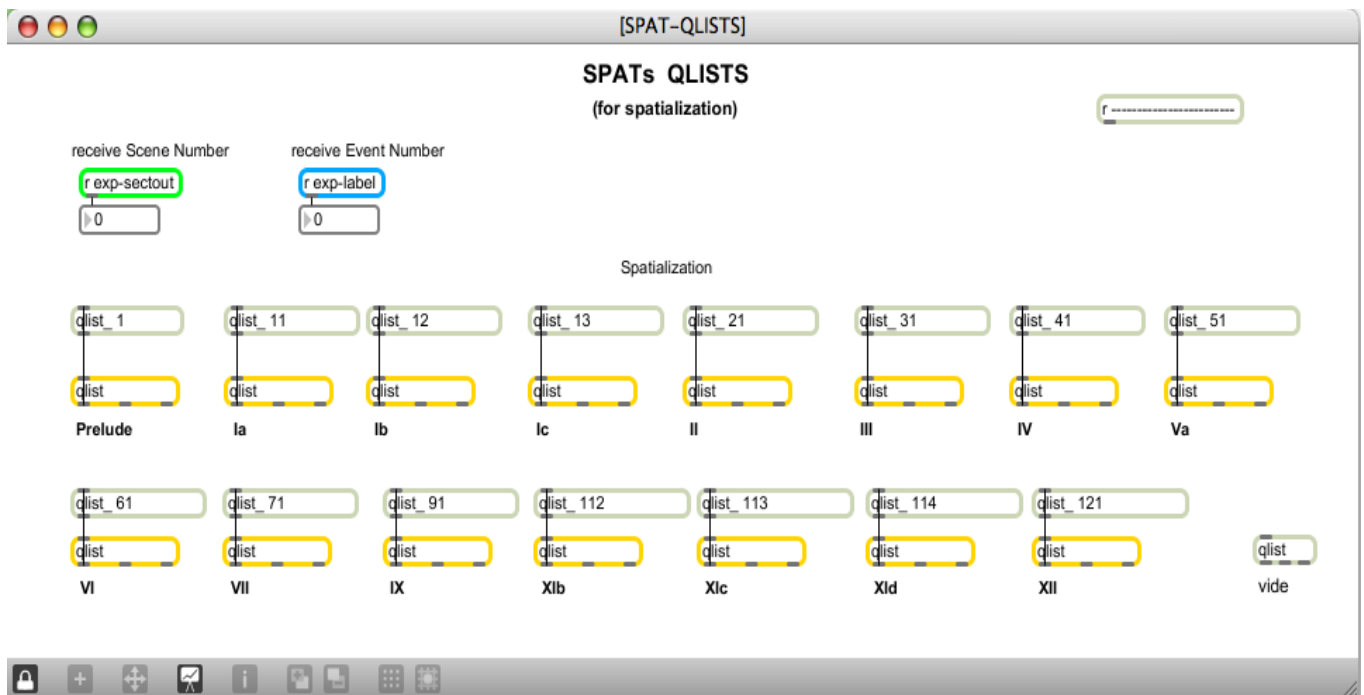




the 2nd for **Direct-to-Disk** samples triggering:



the 3rd for **SPATs and Spatial Trajectories** event-related cues triggering:




## Troubleshooting

If glissandi don't sound right, or they're too slow, check overdrive and audio interrupt on on Max5 "DSP Options" panel.

## The PROLOGUE - excerpt from the Opéra

This excerpt shows how PAFs, samplers, harmonizer, delay, leslie, reverb should sound. (Psola synthesis is not used here)

© IRCAM  BY-NC-ND

This documentation is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).  
Version documentation creation date: Oct. 16, 2013, 12:04 p.m., update date: May 6, 2021, 3:10 p.m.