

Yan Maresz

Metallics

1995

2001,

Metallics 2015-max6
2015



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

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Work related information

Performance details

- Jan. 14, 1995, Paris, Ircam, Espace de projection, concert Cursus (création partielle)
- May 2, 2001, (version en temps réel MSP) Paris, Ircam

Publisher : Durand

Detailed staff

- trumpet

Realisation

- Xavier Chabot
- Manuel Poletti

Useful links on Brahms

- [Metallics](#) for trumpet and electronic device (1995), 11mn
- [Yan Maresz](#)

Version related information

Performance date: Jan. 16, 2015

Documentation date: Oct. 2, 2015

Version state: valid, validation date : May 3, 2018, update : May 6, 2021, 3:09 p.m.

Documentalist

Benoit Meudic (Benoit.Meudic@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)
- Benoit Meudic (Computer Music Designer)

Version length: 11 h

Default work length: 11 mn

Upgrade Motivation

Max6 version with choice between "real-time with click track", "real-time with pedal", tape version and simulation mode.

Other version(s)

- [Yan Maresz - Metallica - Concert Lausanne 13th March 2023 \(March 14, 2023\)](#)
- [Yan Maresz - Metallica - Taiwan Octobre 2022 \(Feb. 6, 2023\)](#)
- [Yan Maresz - Metallica - March2022 \(March 10, 2022\)](#)
- [Yan Maresz - Metallica - METALLICS_November2021 \(Nov. 25, 2021\)](#)
- [Yan Maresz - Metallica - Metallica 2021-max8-48kHz-64bits \(May 20, 2021\)](#)
- [Yan Maresz - Metallica - Metallica 2020-max8-48kHz \(Sept. 11, 2020\)](#)
- [Yan Maresz - Metallica - Metallica 2015 Philharmonie \(Jan. 21, 2015\)](#)
- [Yan Maresz - Metallica - Metallica 2014-10-01 Musica \(Oct. 6, 2014\)](#)
- [Yan Maresz - Metallica - Metallica Max6 \(March 7, 2014\)](#)
- [Yan Maresz - Metallica - Metallica TR 2013 \(Oct. 2, 2013\)](#)
- [Yan Maresz - Metallica - Tape+click version \(Oct. 22, 2012\)](#)
- [Yan Maresz - Metallica - transfert_mustica_ftp \(April 14, 2010\)](#)

Electronic equipment list

Computer Music Equipment

- 1 MacBook Pro - *Apple Laptops* (Apple)
Apple 2.8 GHz or more - Mac OS X
- 1 Digital Performer - *Music Software* (MOTU)
- 1 Max 6 - *Max* (Cycling74)
version 6.1.6 or above (max 7 to be tested)
- 1 Hammerfall - *Sound Board* (RME)
1 soundboard with at least 1 input and 5 outputs
- 1 BCF 2000 - *MIDI Mixer* (Behringer)
recommended to mix the electronic part
- 1 Footswitch / Sustain Pedal - *Footswitch / Sustain Pedal*
optional sustain pedal for triggering events
- 1 Midi interface - *MIDI Interfaces*
optional, if use of pedal

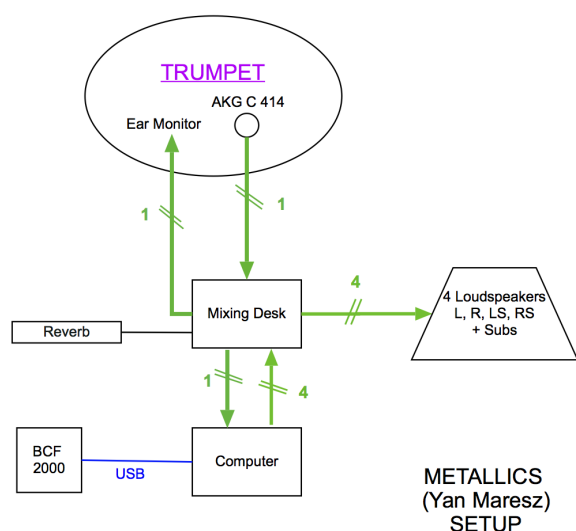
Audio Equipment

- 1 Microphone - *Microphone*
for trumpet
- 4 Loudspeaker - *Loudspeakers*
- 1 subwoofer - *Subwoofers*
- 1 ear-monitor - *Headphones*
for the player, in-ear click-track
- 1 Mixing Console - *Mixing Console*
Min 5 outputs

Files

File	Type	Author(s)	Comment
max patch, libraries and sound	Patch		
technical setup	Setup	Melina Avenati	Microphone, Midi and audio setup
ADC-ClementSaunier	Simulation files		

Instructions



ABOUT THE PIECE AND THE SETUP

The trumpet is playing through a microphone. The microphone signal is sent both to the four loudspeakers and to the sound inputs of the Mac, where it will pass through various effects such as delays, reverbs, filters, harmonizers, spatializers, chorus...then it is sent back to the four loudspeakers and mixed together with the trumpet signal. The effects signals are ran in real time under the Max/MSP 6.1.9 software. MSP calculates the effects signal while Max sends events to the effects, in order to modify their behavior all along the piece. The writing of the piece brings a constant interaction between the player and the electronics, so the electronics are calculated according to what he's playing. If required by technical constraints is also possible to play a tape instead of live electronics (triggering mode 'click+bande').

For best results it is recommended for the player to play the written rythm as "sharp" as possible.

The composer wishes that the trumpet player is located on the back of the stage (as far as possible from the audience).

Audio setup

YAN MARESZ - METALLICS (1995) for solo trumpet and live electronics

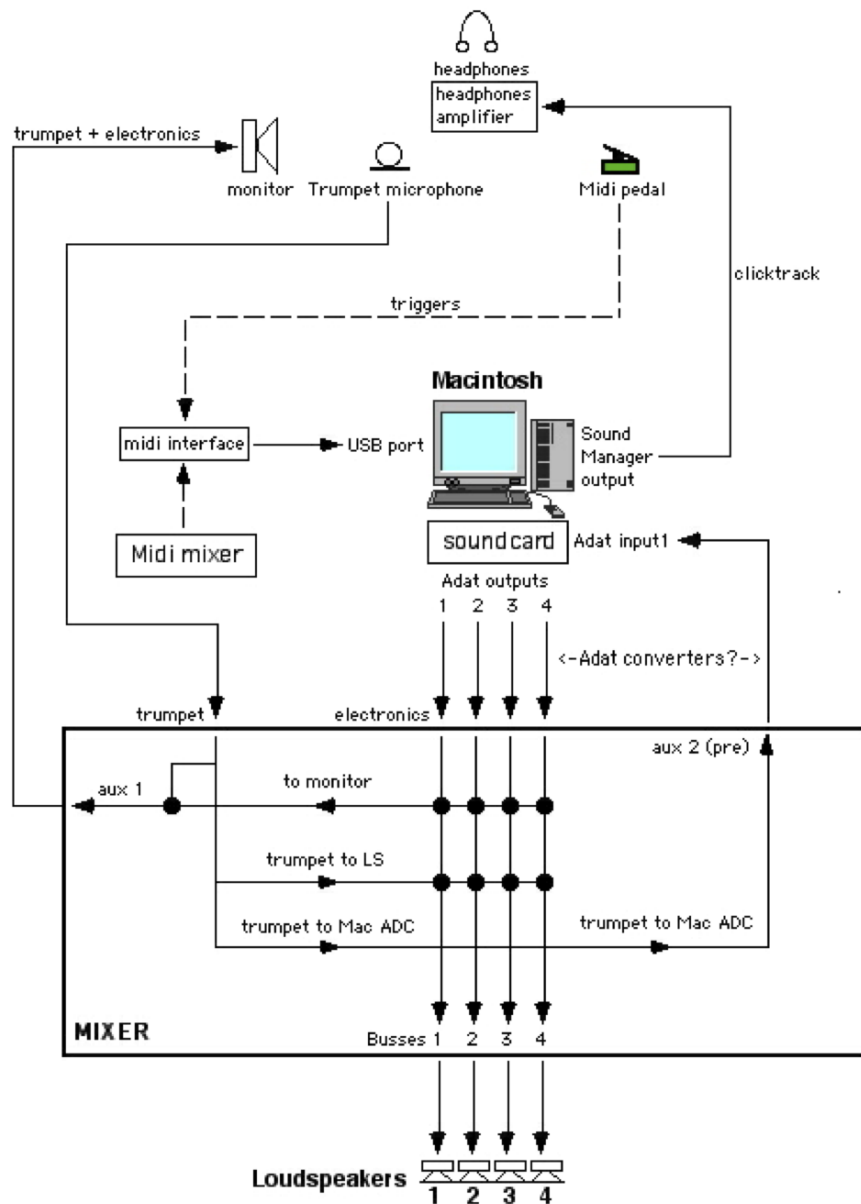
Production: IRCAM

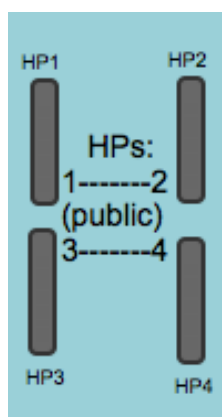
Real time version running under Apple Macintosh

- first patch version on NEXT/IRCAM-ISPW by Xavier Chabot
- ported to Cycling74 Max/MSP by Manuel Poletti (2001) - contact: <manuel.poletti@ircam.fr>

Yan Maresz - Metallics (2001)

Audio & Midi connections

**Loudspeaker setup**



CONFIGURING THE MAC

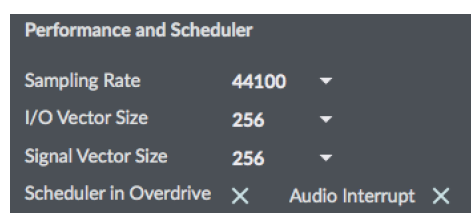
MAX/MSP calculates a complex set of real time sound signals, with multi inputs/outputs sound routing, receives and sends midi events, displays graphics, etc... All this takes a lot of the power of the CPU of the Mac processor when playing large patches such as *Metallics*. That's why it's always a good idea, when performing a live piece in front of an public audience, to minimize the risk of crashes of the machine, due to CPU overloading, or extensions conflicts. We recommand to :

- disactivate BlueTooth and unrequired Wifi.
- disactivate automatic launch of Screen Savers,
- disactivate automatic suspension of hard Drives and put every activity suspension to "never". (Mac OS X : see System Preferences > Energy Saver)

INSTALLING

- Download "*Metallics-2014-Max6.dmg*", open it and copy everything in a folder on your computer.
 - Launch MaxMSP 6.1.9 before everything. Select this folder (and only this one) in the 'file preferences' menu.
- Check your audio outputs with the max audiotester.

The *Metallics* max patch will set vector sizes and other preferences automatically when you reset.



There are 5 outputs: dac 1..4 respectively on loudspeakers 1-front-left, 2-front-right, 3-middle-left, 4-midle-right, and dac 5 for click-track.

- Launch the patch "*Metallics-2014-Max6*". Check the Max Window : you should see something like this, which means that everything is fine :

Max	
Object	Message
udpreceiver	binding to port 7000
	sampler~: version 2.6 (64-bit) (Jul 10 2013 - 16:25:54)
	Spat~: version 3.4.1 for Max/MSP - IRCAM
	- Spat~ extern lib : FC -
	- Spat~ extern lib : radiation -
	- Spat~ extern lib : timecrit -
	- Spat~ extern lib : localisation -
	- Spat~ extern lib : amp~ -
	- Spat~ extern lib : hlshef1~ -
	- Spat~ extern lib : amp_4~ -
	- Spat~ extern lib : amp_2~ -
	- Spat~ extern lib : 8c_cluster~ -
	- Spat~ extern lib : 8c-reverb~
	- Spat~ extern lib : 8c_early~ -
	- Spat~ extern lib : hlshef1~ & hlshef1v~ -
	- Spat~ extern lib : Pan~control_ext -
	- Spat~ extern lib : panr4~ -
	- Spat~ extern lib : panr4 -
	- Spat~ extern lib : panc -
soundfiles	preload 2 metalx01*+rev
soundfiles	preload 3 metalx02*opens
soundfiles	preload 4 metalx03*cups
soundfiles	preload 5 metalx04*straights
soundfiles	preload 6 metalx05*harmonics
soundfiles	preload 7 metalx06*new6
soundfiles	preload 8 metalx07*scale-down
soundfiles	preload 9 metalx08*Monster
soundfiles	preload 10 metalx09*whisperchord
soundfiles	preload 11 metalx10*glisses
soundfiles	preload 12 metalx11*rips
soundfiles	preload 13 metalx12*Dev6withAcresc
soundfiles	preload 14 metalx13*WHAdd1
soundfiles	preload 15 metalx14*WHAdd2
soundfiles	preload 16 metalx15*wabemolrev+
soundfiles	preload 17 metalx16*heavywa1
soundfiles	preload 18 metalx17*heavywa2
soundfiles	preload 19 metalx18*new
	Antescofo~ - Stopped!
clicktrack	0
	Antescofo~ - Stopped!
pedal-enable	1
score	MTX14-midisimul-click.asco
	Antescofo~ - Stopped!
	Antescofo~ - Stopped!
	Antescofo~ - Score loaded succesfully with 735 events and 1294 actions.
Decoder~	dummy module (just lets signals through)
Source~	only equalizers.

- Two windows open : the main patch 'MetalX-2014-Max6' and the patch 'event-trigger':

Yan Maresz's
Metallics (1995)

MSP port by Manuel Poletti - IRCAM 2003
Max 5 - Grégoire Lorieux - 2009 - IRCAM
Max 5 - mise à jour events :
Yan Maresz & Benoit Meudic - 2009 - IRCAM
Max 6 - mise à jour events & intégration antescofo
Yan Maresz, Benoit Meudic, Serge Lemouton - 2014 - IRCAM

parameters

☐ enable events triggering

MIDI input devices selection
(options saved with patcher)

triggering pedal ☐ update menu ☒ enable pedal ☐ inverse polarity ☐

to Max 1

mixing faders ☐ update menu ☒ enable faders

IAC Driver Bus I...

IP display device

169.254.239.50 ip (port 8000)

p reset

panic bang <- out mike + dacs - stop soundfile

open-spat-oper open

dsp driver setup (best is to turn DSP off first)

demos front

1- reset all DSP modules

2- open 'event-trigger' and choose triggering mode.

3- DSP START/STOP

chorus DACS chorus SPAT RESON OUT BANKS SAMPLER HARMS DELAYS

ctlin 12 ctlin 9 ctlin 5 ctlin 4 ctlin 16 ctlin 7 ctlin 6

157 157 157 157 157 157 157

144 144 144 144 144 144 144

127 127 127 127 127 127 127

112 112 112 112 112 112 112

96 96 96 96 96 96 96

80 80 80 80 80 80 80

64 64 64 64 64 64 64

48 48 48 48 48 48 48

32 32 32 32 32 32 32

16 16 16 16 16 16 16

0 0 0 0 0 0 0

127 127 127 127 127 127 127

SOUNDFILE micro SPAT micro BOUNCE click (HP5) MICRO MASTER

ctlin 8 ctlin 2 ctlin 10 ctlin 13 ctlin 3 ctlin 1

157 157 157 157 157 157

144 144 144 144 144 144

127 127 127 127 127 127

112 112 112 112 112 112

96 96 96 96 96 96

80 80 80 80 80 80

64 64 64 64 64 64

48 48 48 48 48 48

32 32 32 32 32 32

16 16 16 16 16 16

0 0 0 0 0 0

127 127 127 138 127 127

create temp mix presets

HP1 HP2

HPs: 1-----2 (public) 3-----4

HP3 HP4

dac5 = ear-monitor

p faders simul+bande+click

main input

In the Main interface, you can tune general parameters (middle left part - see below the picture "parameters"), adjust the level controls of the electronics (right part) and open important sub-patchers (top right part): 'p events' which contains events, 'p DSP' which contains the signal objects, 'p simul&bande&click' which contains the simulation, the tape and the antescofo click-track sequencer, and 'p event-trigger' which contains controls for event triggering.

Adjust the input level of the trumpet into the patch towards the treatments here :

[event-trigger] (presentation)

Triggering mode click **Play from** m0 **Current event** ---

p triggering-mode ☐ start again ☐ p event

reset

stop-sfile bang

Click start/stop ☐ (space/return key)

click begin : wait 8 click gain

Clicktrack is sent to the instrumentist via dac 5

to-dac5

simul to direct **simul to electro**

bande front **bande back**

☐ p key ☐ right/left ☐ trigger

enable key inc/dec tab key

In the 'event-trigger' window, you can start/stop click-track, choose the triggering mode, choose where to start in the score, control the levels of click/simul/bande, and in case of pedal triggering, select next event.

- Where I am supposed to click ? What I am supposed to do ?
 - In the patch : click on «reset» then on «reset yan-bang» each time you stop the rehearsal or you begin.
 - Choose with the trumpeter the best way to play the piece (See below for details):

- click (recommended),
 - 'click+simul' (for rehearsals without trumpeter),
 - 'click+bande' (for concerts without live electronics),
 - pedal triggering (if the instrumentist triggers events with a pedal)
 - pedal-dp (if events are triggered from digital performer)
3. Start DSP
 4. Then you can select where you want to start from (menu 'Play from' of the patch 'p event-trigger'), and click the toggle 'Click start/stop' for starting/stopping the click.

With live electronics, two technical possibilities are proposed to find a good balance between a better "accuracy", for more live feeling, and a better "efficiency", for more preciseness, according to the trumpet player.

1) first possibility:

Events are triggered by a sequencer (antescofo) which is automatically loaded with the Max patch. While the events are automated inside the patch, the midifile sends a continuous clicktrack to the player via headphones.

This way, nor the player nor the musical assistant have to care about the regularity of triggers, or of events mismatches.

That's a better way to keep the maximum of efficiency.

2) second possibility:

Events are triggered by the trumpet player him(her)self, using a midi sustain foot pedal. Events are notified inside the musical score, so (s)he can synchronize them to his/her playing. The midi pedal device should be selected in the menu "trigerring pedal" on the left of the main screen (see picture "parameters").

The musical assistant should follow the score and check that the player doesn't miss any event. He has the possibility to correct the errors, using the Mac keyboard, or by clicking with the mouse into the Max patch.

Some parts of the piece need that the events are triggered synchronously with some soundfiles, so, for those parts, a clicktrack is sent to the player via headphones.

This possibility is not recommended by the composer.

Another mode (pedal-dp) can be used for triggering events from a simulation session in digital performer. In this case, any midi output note from digital performer is taken as an event triggering. The dp midi device should be selected in the menu "triggering pedal" (see picture "parameters").

Note: Clicking on the grey messages of each menu ("triggering pedal" or "mixing faders") you will have access to the corresponding max patchers.

TAPE VERSION

If for some reasons the piece can not be played with live electronics, it is possible to use the tape (triggering mode 'click+bande'):

For this option, you just have to select the triggering mode 'click+bande' and then start click-track (you can choose also where to start from with the menu 'Start from').

You should also send the "real" trumpet to the reverb and follow it during the concert, depending on the musical context.

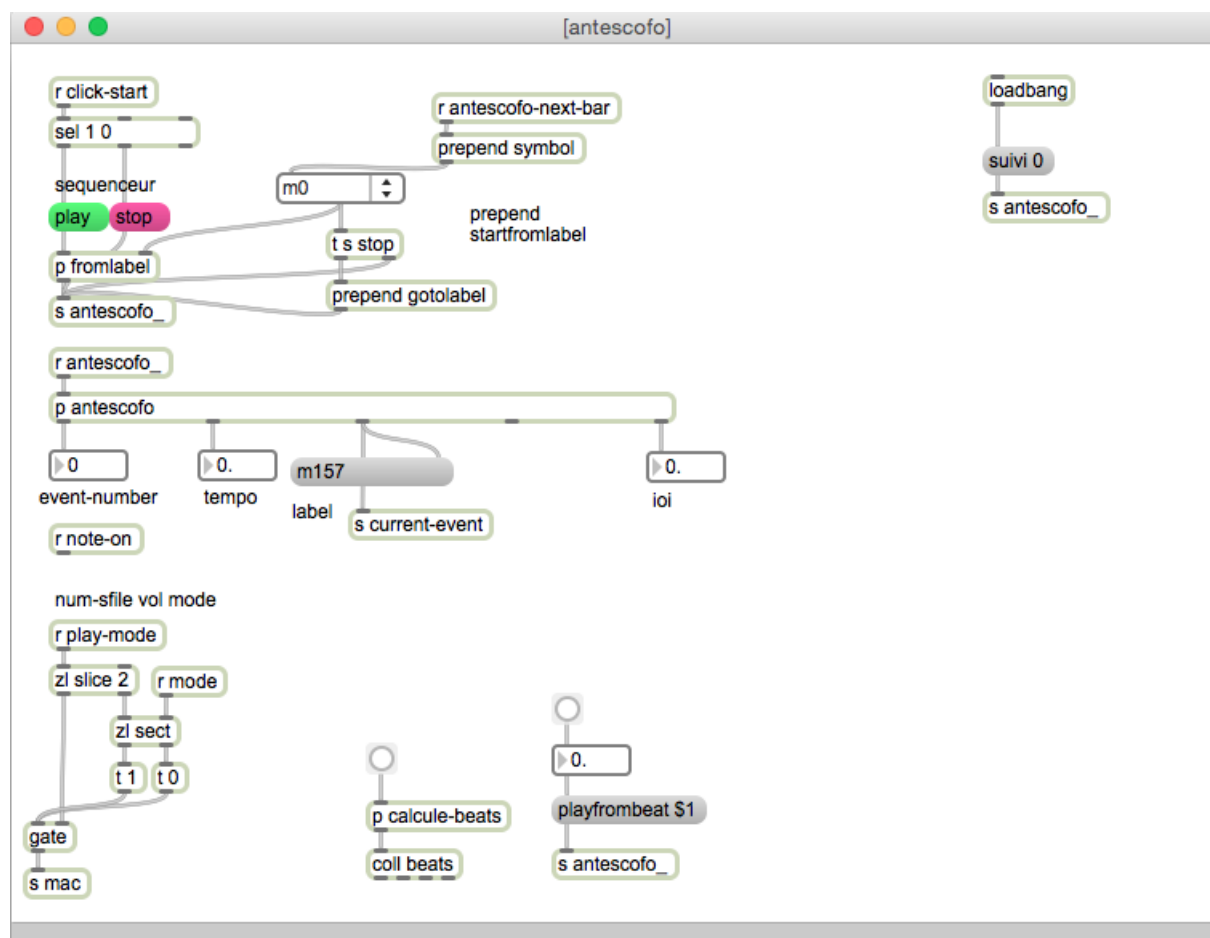
During the rehearsals, you can also use the triggering mode 'click+simul' in order to simulate the trumpet.

Note: an mp3 version of the tape+click-track is also available for rehearsal in "media/_Metallics-2014-Practice-Tape.mp3"

Two trumpet recordings are also available for tests and set-up: "media/TrumpetPart-cure.aiff" and "media/TrumpetPart-gaudon.wav".

ABOUT THE CLICK-TRACK

The click-track is sequenced by antescofo ('p antescofo') with the score 'MTX14-midisimul-click.asco'.



The pitches are sent to 'sfplay~' with 'clave1.wav' and 'clave2.wav' sfiles.

The events are named according to the bar at which they are positioned. (ex m52 stands for an event at bar 52).

In the simulation mode it is possible to start from any bar (label).

In the click mode a selection of starting points is proposed in the menu 'Start from' of the patch 'p event-trigger'.

ABOUT SOUND DIFFUSION

The trumpet signal is sent to the four loudspeakers through the max patch after spat/reverb treatment. Each of the four sound outputs of the Mac is sent separatley to one of the four speakers (out1 to ls1, out2 to ls2, out3 to ls3, out4 to ls4).

1---2

3---4

One should find a good balance between the trumpet and the electronics signals, keeping in mind that electronics are a constant and essential part of the piece, and that one should hear the different signals (live & electronics) like sounding all "together".

The four loudspeakers must be turned in order to form the most regular squared quadraphony possible around the audience. The sound result must be a constant and omnipresent energy. In very "dry" rooms, the sound ingeneer should inject both the trumpet and the electronics signals into a slight reverb effect, whose output should be diffused into each of the loudspeakers, in order to compensate eventual sound "holes". The reverb parameters should be set in accordance to the size of the room, in order to keep a realistic effect. The only source that is really directional is the real acoustic sound from the trumpet.

Some electronic effects can variate their behavior, according to the trumpet player, the microphone and the P.A. that are used, or the room where the piece is performed. For those reasons, the musical assistant has the possibility to re-mix every sound effect that comes from the Mac separatly, either by using an external midi mixing console, either directly inside the patch by using the mouse. Generally, (s)he won't have to do much mixing during the piece, only some global and slight corrections.

MIXING LEVELS

The mix can be controlled with a midi mixer (for instance a berhinger bcf2000). You can select the midi mixing device in the menu "mixing fader" (see picture "parameters").

The controller numbers are mapped to faders that control independantly levels of effects, input or output. You can change this mapping by changing each corresponding menu in the main patch.

The default mapping is the following:

- controller number - effect :
- 12 - chorus,
- 9 - chorus to spat,
- 5 - reson,
- 4 - banks,
- 16 - sampler,

- 7 - harms,
- 6 - delays,
- 8 - soundfile,
- 2 - micro spat (micro to spat),
- 10 - micro bounce (micro to reverb),
- 13 - click,
- 3 - trumpet,
- 1 - main output master

First versions


Realised at IRCAM (Cursus) - Musical assistant : Xavier Chabot

First unfinished version - Premiere : 14 Janvier 1995 at IRCAM (Concert Atelier) - Trumpet : Laurent Bômонт

Definitive version - Premiere : 8 et 9 avril 1995 à IRCAM (journées portes ouvertes) - Trumpet : Laurent Bômонт

Tape version - Premiere : 13 Mai 1995 in New-York - Trumpet : Wayne Du Maine

Version MSP Version - musical assistant : Manuel Poletti - Premiere : 2 Mai 2001 à Paris - Trumpet : Laurent Bômонт

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Program note

Note pour la version ADAT ou Protocols

Ecrite à l'Ircam durant le cursus de composition et d'informatique musicale de 1994, la pièce a été créée dans sa version complète par Laurent Bômout lors des Journées Portes Ouvertes en 1995. La version originale fait appel au programme Max sur la station Next de l'Ircam qui sert de base pour la gestion de tous les événements électroniques en temps réel : synthèse par filtres, traitements, *sampling*, spatialisation et déclenchement de sons *direct-to-disk*. Pour cette pièce, l'Ircam a mis au point deux outils permettant une plus grande interactivité entre l'instrument et l'ordinateur ; un micro-capteur situé dans l'embouchure de l'instrument, et qui, par une analyse très précise du signal d'entrée, permet de faire un suivi de hauteurs et d'amplitude, ainsi qu'un petit déclencheur situé sur l'instrument et qui est actionné par le pouce de l'interprète.

J'ai toujours été fasciné par les changements de caractères qu'offre l'utilisation des sourdines sur les instruments de cuivre, démultipliant ainsi leur possibilités expressives. Après avoir porté mon choix sur la trompette, nous avons entrepris une étude des propriétés acoustiques des principales sourdines utilisées par l'instrument : bol, sèche, *harmon*, wa-wa et *whisper*. Après analyse des caractéristiques propres à chaque sourdine, j'ai tenté de recréer la transformation qu'elles opèrent sur la trompette en lui appliquant en temps réel les enveloppes spectrales de chaque sourdine (par filtrage formantique). La trompette est particulièrement bien adaptée à ce type de transformations, de par son utilisation même de sourdines qui font exactement cela d'un point de vue acoustique. J'ai donc pu simuler ces différentes sourdines sur l'instrument qui, par ailleurs, les utilise aussi dans la pièce, créant ainsi un jeu entre image sonore réelle et ombre synthétique.

Les résultats d'analyses des sourdines m'ont aussi offert une base formelle, car il s'est avéré quelles se classaient naturellement dans une échelle d'harmonicité/inharmonicité en comparant la déviation de leurs informations spectrales par rapport à celles de la trompette ordinaire. J'en ai donc suivi le modèle, dans un parcours musical segmenté en mouvements distincts, présentant à partir de la trompette ordinaire, les sourdines de la moins bruitée vers la plus bruitée avec, entre chacune d'entre elles, des parenthèses de trompette ordinaire (évoluant aussi vers des modes de jeux de plus en plus bruités) durant lesquelles s'opère le filtrage formantique. Le caractère musical de chacun des mouvements est lui, dû à l'acceptation et à l'incorporation des archétypes sonores et des références musicales inévitables propres à la trompette et à ces différentes sourdines.

De plus, les informations spectrales, régissent aussi en grande partie divers paramètres comme les notes pivots, les cellules mélodiques ainsi que l'harmonie. D'autres types de sons présents dans la pièce et déclenchés en *direct-to-disk* proviennent d'échantillons de trompette, de cuivres divers et de quelques percussions métalliques.

Dans la version avec bande, la plus grande partie des sons électroniques provenant du traitement en temps réel a été récupérée, mais, les traitements spécifiquement interactifs comme la spatialisation de la trompette ainsi que tous les procédés de filtrage sur l'instrument décrits précédemment sont absents. Toutefois, une simulation des réponses de ces différentes sourdines a été effectuée à l'aide d'échantillons de trompette.

Note pour la version temps réel Macintosh-Max/MSP

Ecrite à l'Ircam durant le cursus de composition et d'informatique musicale de 1994, la pièce a été créée dans sa version complète par Laurent Bômout lors des Journées Portes Ouvertes en 1995. La version originale fait appel au programme Max sur la station Next de l'Ircam qui sert de base pour la gestion de tous les événements électroniques en temps réel : synthèse par filtres, filtrage, traitements divers, *sampling*, spatialisation et déclenchement de sons *direct-to-disk*. La pièce existe désormais dans une version temps réel Macintosh/MSP.

J'ai toujours été fasciné par les changements de caractères qu'offre l'utilisation des sourdines sur les instruments de cuivre, démultipliant ainsi leur possibilités expressives. Après avoir porté mon choix sur la trompette, nous avons entrepris une étude des propriétés acoustiques des principales sourdines utilisées par l'instrument : bol, sèche, *harmon*, wa-wa et *whisper*. Après analyse des caractéristiques propres à chaque sourdine, j'ai tenté de recréer la transformation qu'elles opèrent sur la trompette en lui appliquant en temps réel les enveloppes spectrales de chaque sourdine (par filtrage formantique). La trompette est particulièrement bien adaptée à ce type de transformations, de par son utilisation même de sourdines qui font exactement cela d'un point de vue acoustique. J'ai donc pu simuler ces différentes sourdines sur l'instrument qui, par ailleurs, les utilise aussi dans la pièce, créant ainsi un jeu entre image sonore réelle et ombre synthétique.

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