The Scent of Elysium

for electronic music ensemble and 52.1 surround sound system (2021)

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Premiere by Ensemble Decipher
11-15-2021

Introductory description of the piece

“The Scent of Elysium” is a composition for electronic music ensemble and the 52.1 surround sound system housed at Ciminelli Hall at Buffalo State College. The work is written in three main sections which evolve over time through the use of the Hall’s three most relevant auditory display modalities, namely: continuous panning of sound(s) among any of the 53 speakers; fast, point-source sound placement, and the of use of Doppler effects and channel/speaker-based audio effects.

The piece calls for six performers. Five musicians play and process audio in real-time, and manually create the spatial motion for those sounds. They use hardware synths for sound generation, and game controllers, keyboard controllers and tablets for audio generation, audio processing and also for the spatial trajectories. These five musicians all use dedicated software specifically written for the work. The sixth musician, runs CIM – Creative Immersive Music, – a software application which contains the sound diffusion algorithms that control the surround sound system.
CIM is an extensive research and performance software tool that is unique to the sound system in Ciminelli.
A major aesthetic and functional goal of the software is to make the network of 53 speakers behave as a musical instrument that can be played and manipulated with great flexibility.

“The Scent of Elysium” was composed for, and will be premiered by the Ensemble Decipher. It is the first multi-channel electronic music composition to be played at Ciminelli Hall that makes full use of its singular audio diffusion capabilities.

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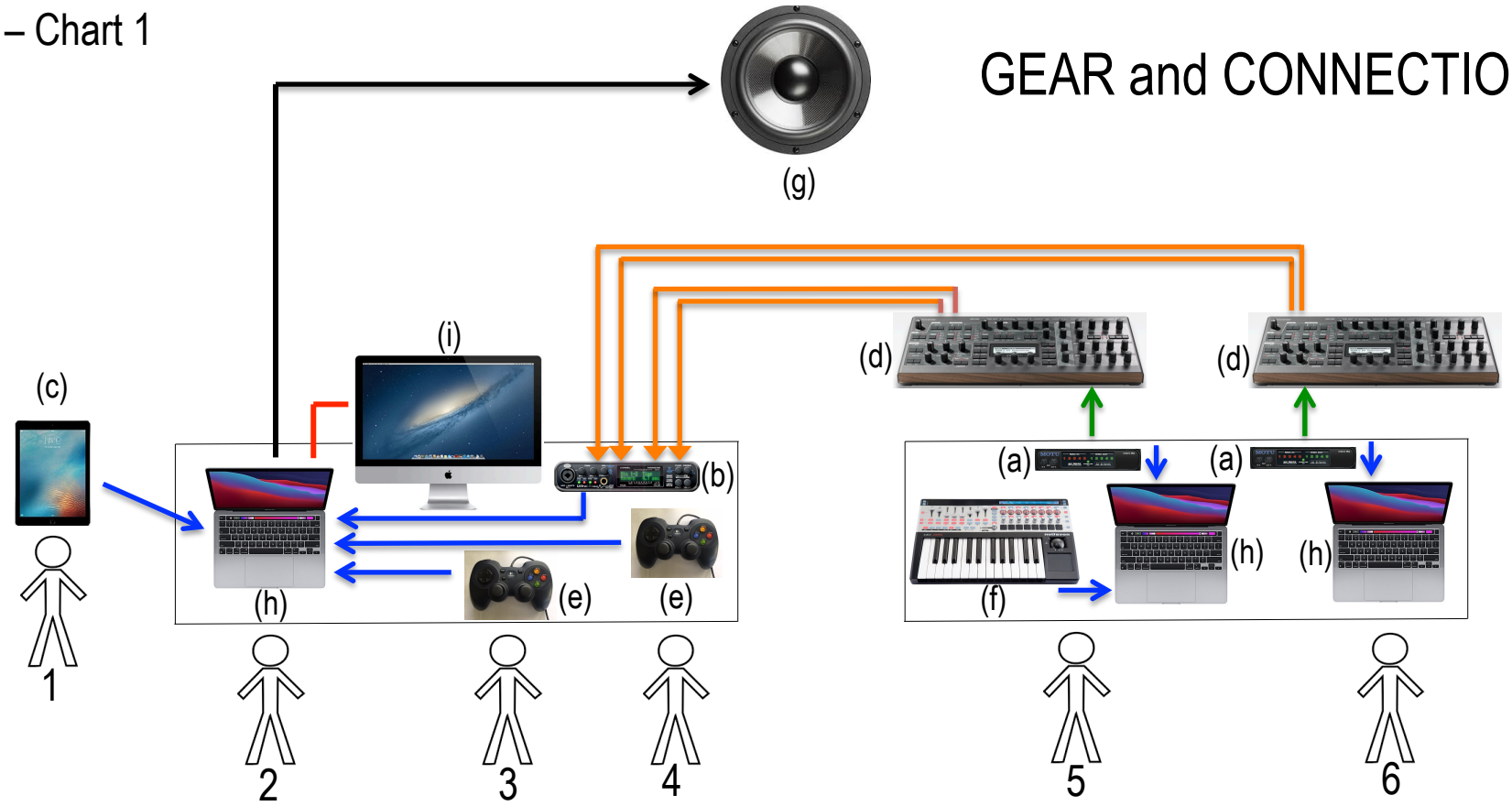
4 – Chart 1

GEAR and CONNECTIONS



CONNECTIONS – Color code

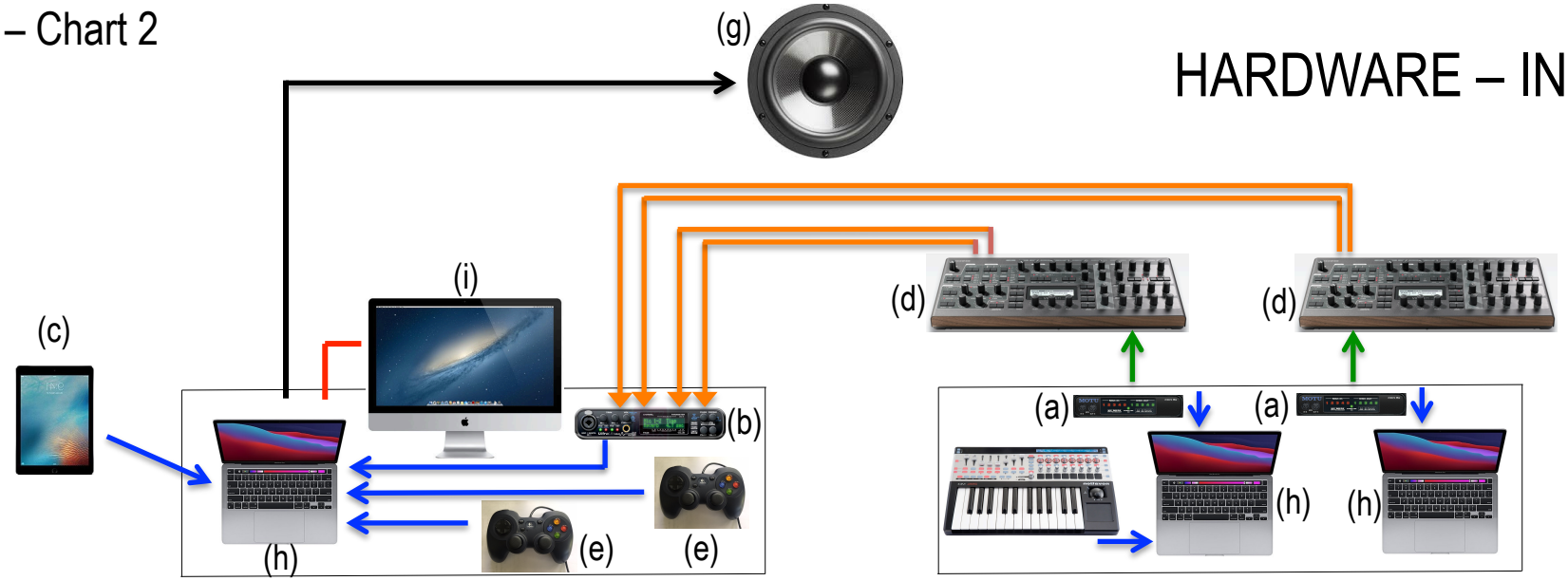
- USB
- AUDIO
- MIDI
- DANTE Audio Net

GEAR – Description

- (a) MIDI Interface
- (b) Audio Interface
- (c) iPad
- (d) Synth ‘Access Virus’
- (e) Game Controller
- (f) Kbd controller
- (g) Surround system
- (h) Computer
- (i) Computer Monitor

5 – Chart 2

HARDWARE – INFO



(a) MIDI Interface – 2x MIDI interfaces. Only one MIDI OUT Port required. Interfaces connect 2 computers to 2 hardware synths

(b) Audio Interface – 1x Audio interface with at least 4 AUDIO INPUTS. It connects to computer running the surround system

(c) iPad – Running MIRA for MAX

(d) Synth 'Access Virus' – 2x Desktop hardware synthesizers 'Access Virus TI'

(e) Game Controller – 2x Game controllers: Logitech F310 Dual Action; After Glow GamePad for Xbox 360

(f) Kbd controller – 1x Novation 25SL MKII MIDI Kbd controller

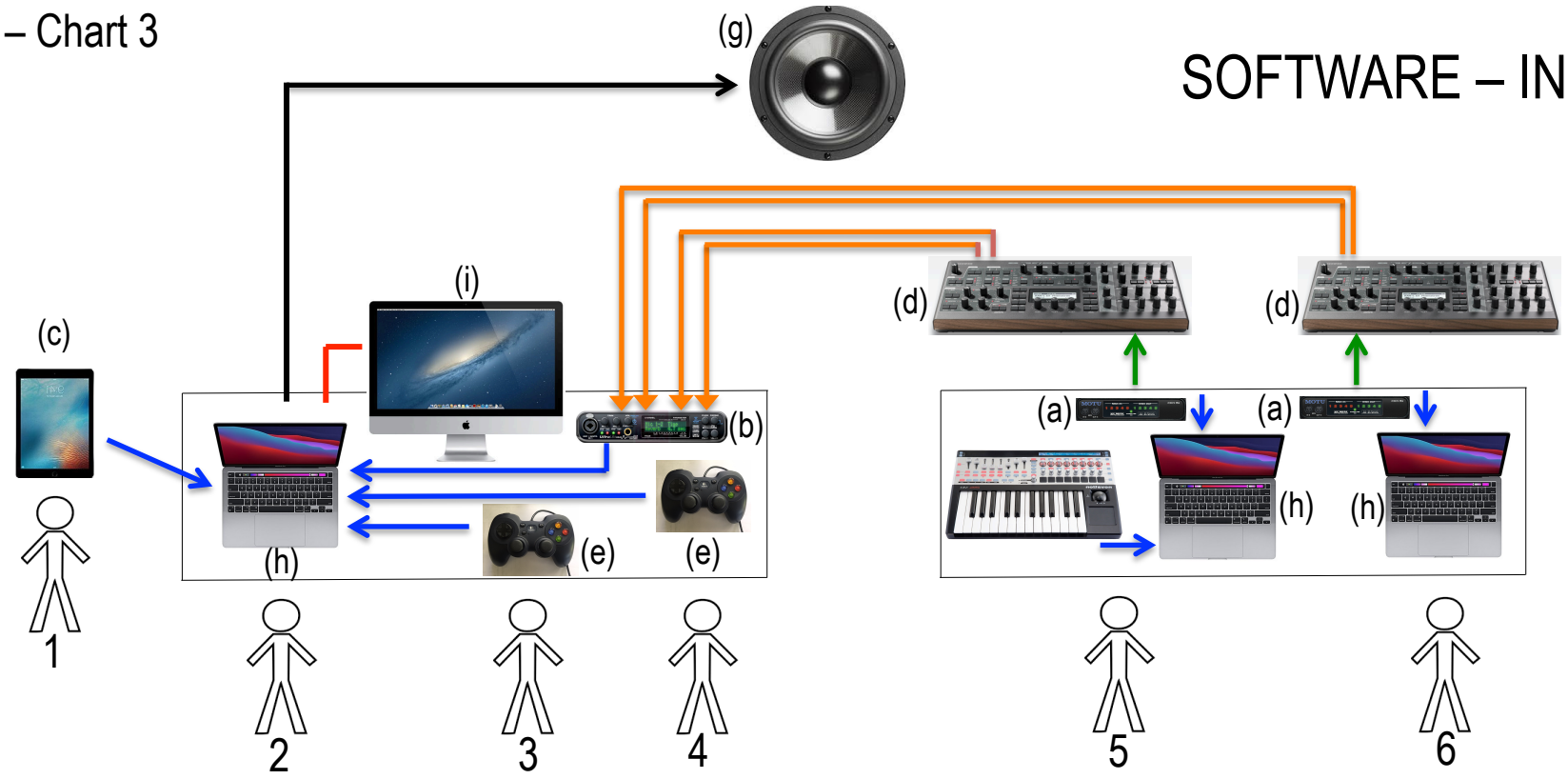
(g) Surround system – Dante Digital Audio Network provides 52.1 channels of audio playback

(h) Computer – 3x Computers. One computer runs CIM (Creating Immersive Audio) software to control the surround system

(i) Computer Monitor – 1 large computer monitor to allow CIM software to display necessary GUI windows

6 – Chart 3

SOFTWARE – INFO



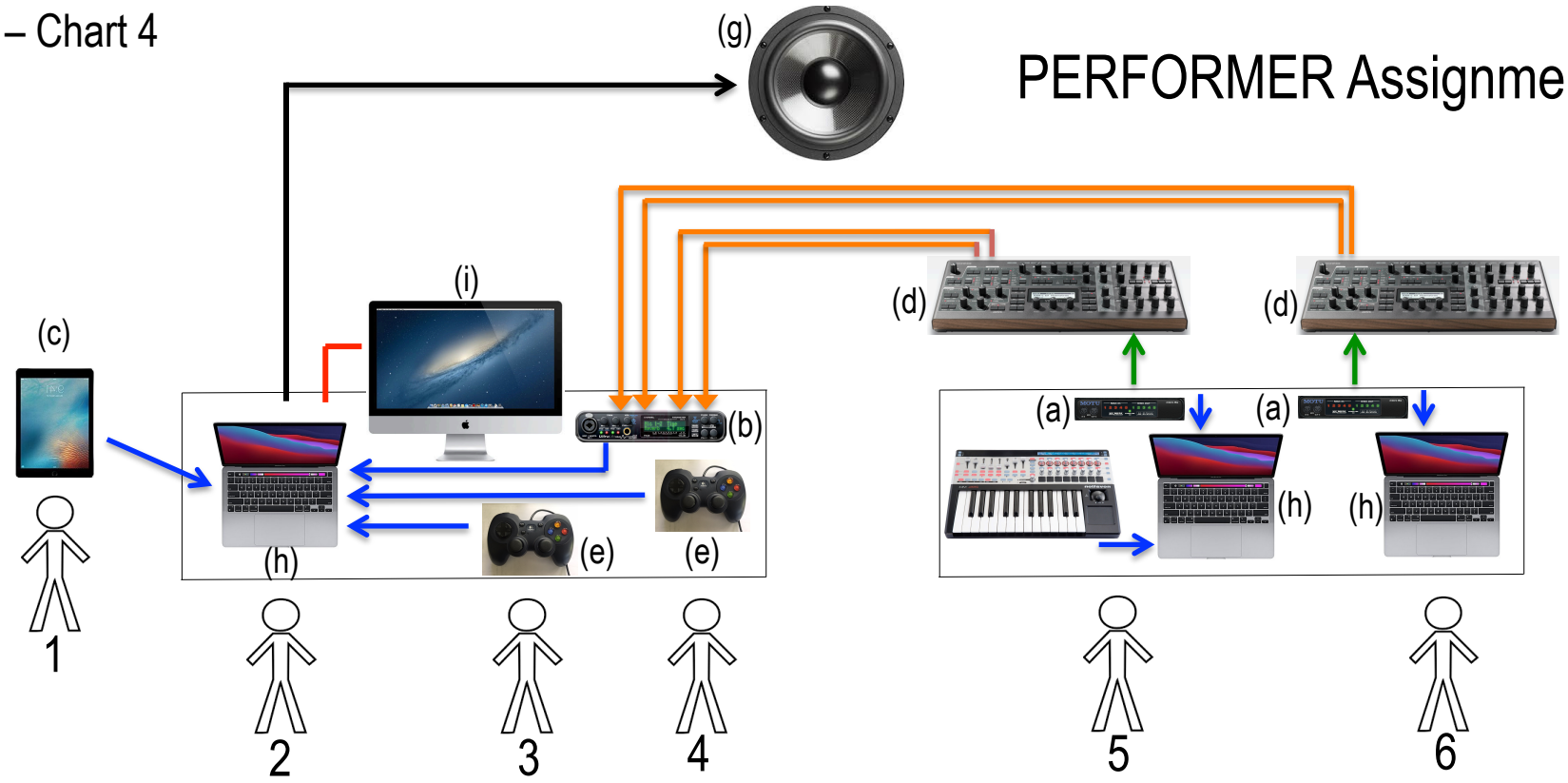
(c) iPad – Runs MIRA under MAX 8

(e) Game Controller – The two game controllers use separate, embedded apps in CIM (which is written in MAX 8)
Each game controller moves sounds that are visually depicted in separate windows

(h) Computer – Computer played by Performer 2 runs CIM (Creating Immersive Audio) to control the surround system
CIM is written in MAX 8
Computers played by Performers 5 and 6, use the app "Access Control" to control the hardware synths
"Access Control" is written in MAX 8
Computers need to run MAC OS 10.12 or higher

7 – Chart 4

PERFORMER Assignments



Performer 1 – Plays five different vocal sounds using iPad running Mira. Sounds live within the CIM software, controlled by Performer 2

Performer 2 – Controls the main surround software (CIM), the automatic spatial patterns, and shares control of time-flow of the piece

Performer 3 – Controls the spatial location of the five sounds played by Performer 1, using a game controller. App hosted within CIM

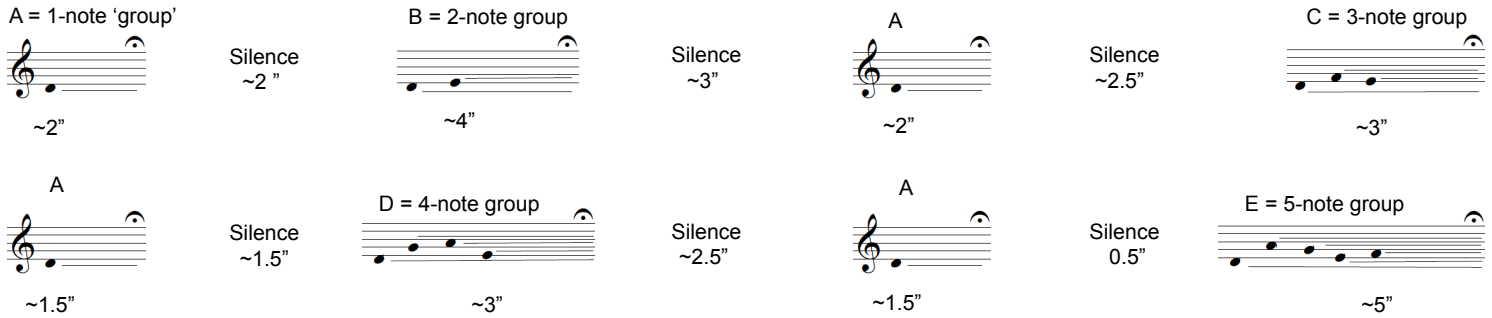
Performer 4 – Controls the spatial location (and volume) of two 'background' audio files played by Performer 2, using a game controller

Performer 5 – Plays two different synth sounds from an Access Virus hardware synth, using a Kbd controller and a laptop running MAX
Does real-time processing on those sounds using the app "Access Control"

Performer 6 – Plays just one synth sound from an Access Virus hardware synth, using a laptop running MAX
Does real-time processing on that sound using the app "Access Control"

PERFORMER 1 – Performance Instructions

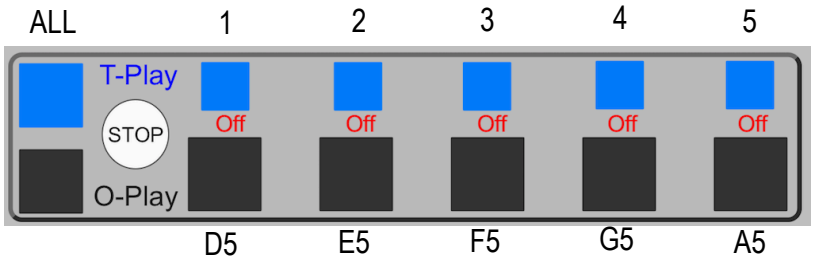
Vocal Theme I (Movement 1) – based on 5 vocal sounds consisting respectively of notes D5 through A5
The 5 sounds are labeled 1 through 5 in the MIRA interface



Vocal Theme I consists of a sequence of 5 note groups (A, B,C D, E) arranged in time as notated above (A B A C A D A E)
The note groups are composed with a distinct number of notes each, from 1 note (group A) to 5 notes (group E)
The theme is meant to feel open, compelling, free flowing, unmeasured

Vocal Theme I is to be played in the first movement of the piece. The first time it plays through as written. All consequent statements and use of the vocal samples material will apply *free permutations* of both the order of the note groups and the order of the notes within each group.

To play the 5 vocal sounds, Performer 1 uses (almost exclusively,) the toggles shown in the figure below, of the MIRA interface
See next pages for a comprehensive explanation

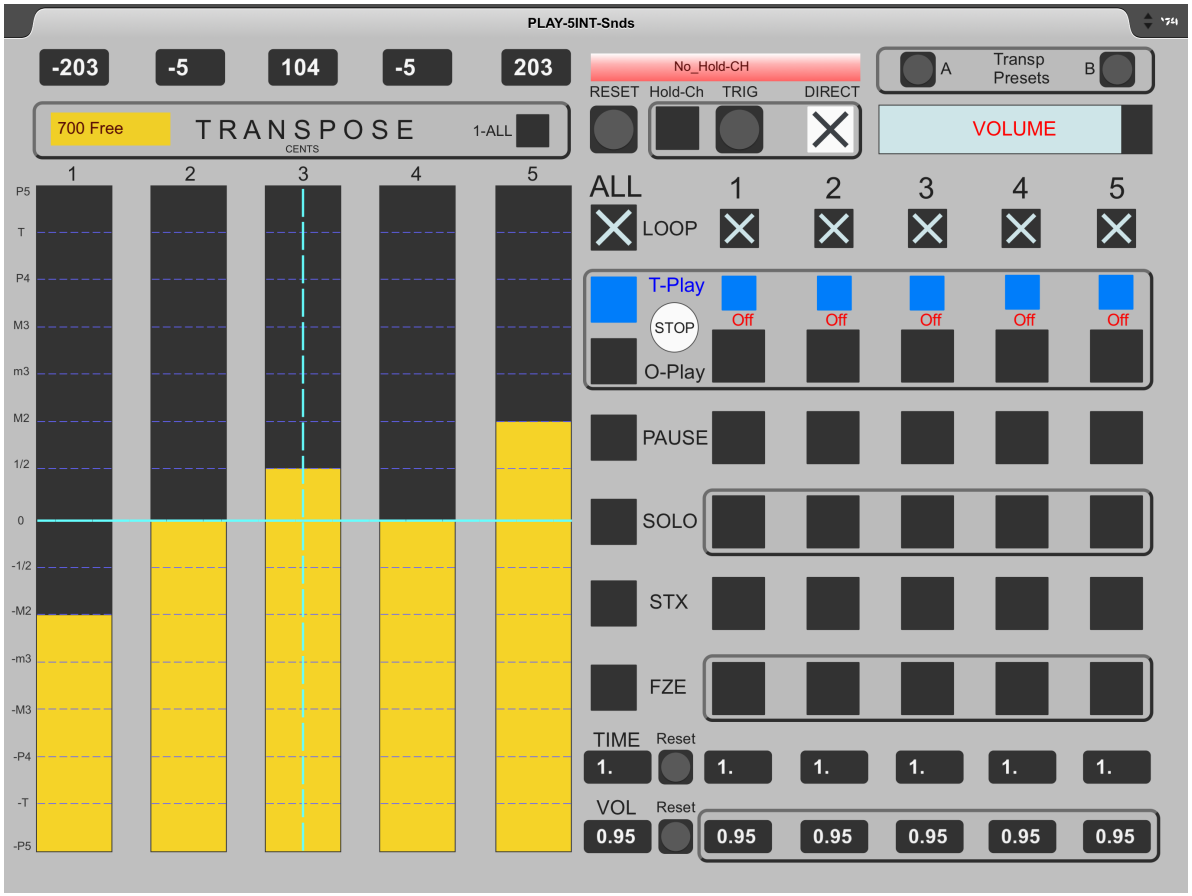


PERFORMER 1 – MIRA GUI Instructions

Performer 1

- Plays five different vocal sounds using iPad running Mira.
- Sounds are loaded in the CIM software environment which is controlled by Performer 2

Interface Main Window



PERFORMER 1 – MIRA GUI Instructions

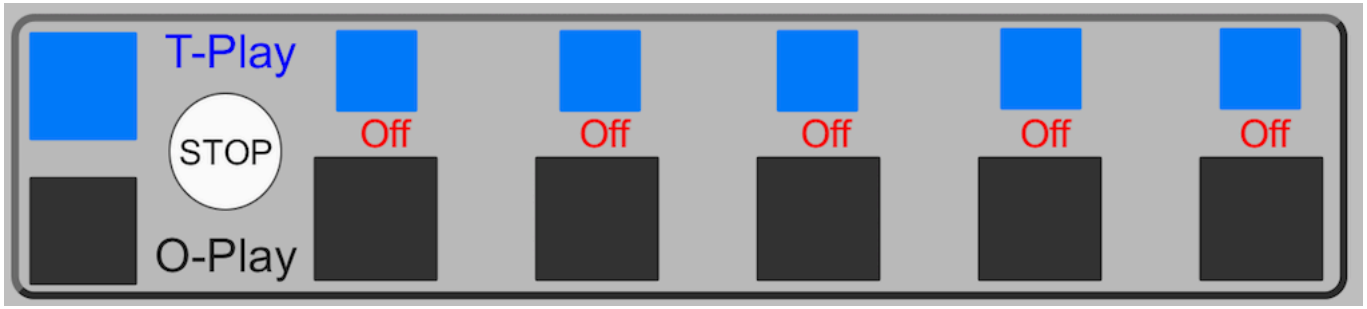
Important: About “ALL” and numbers 1, 2, 3, 4 and 5:

For each transport or processing function, there is one toggle to the left of the name of that function, and a group of five toggles placed to the right.

The toggle placed to the left, under the designation “ALL”, actuates all 5 sounds, simultaneously, whereas the five toggles to the right of the function’s name, numbered 1 through 5, actuate individual sounds (1 through 5)

LOOP Sounds are looped by default at startup
“ALL” Toggles Loops on and off for all 5 sounds, simultaneously
Toggles 1 through 5: Control the Loop Function for each sound

PERFORMER 1 – MIRA GUI Instructions



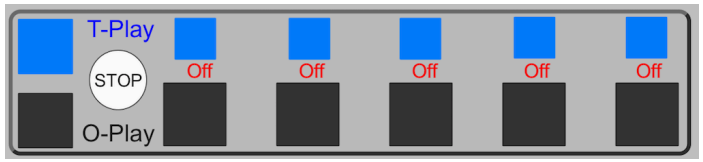
T-PLAY	Play/Stop transposed sounds 1 through 5, individually. *Also keeps TIME expansion/compression altered values*
O-PLAY	Play/Stop sounds 1originall sounds, 1 through 5, individually, without any audio processing
“ALL” BLUE	PLAYS all 5 transposed sounds simultaneously
“ALL” Black	PLAYS all 5 original sounds simultaneously
Off / T / O	Visual feedback about *most recent* version of played sound: Off = No transposition; T = Play transposed; O = Play Original
STOP	STOPS all sounds at once

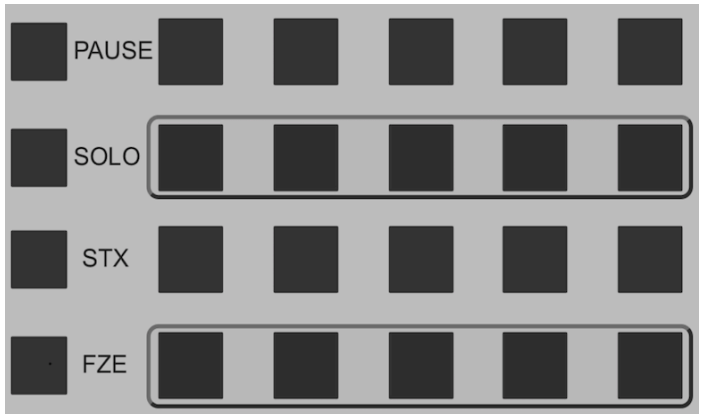
PERFORMER 1 – MIRA GUI Instructions

List of Audio Transport and Audio Processing Functions

Loop

T-Play – Plays sounds with transposition
O-Play – Plays original sounds without transposition
Stop – Stops any sound currently being played

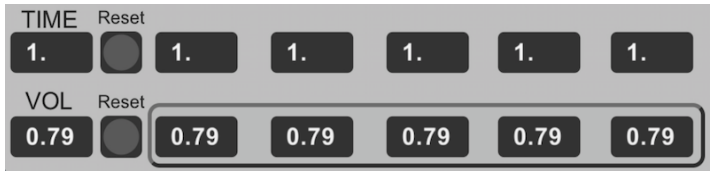




PAUSE	Pause sound
SOLO	Solo sound
STX	Instantaneous Extreme Stretch
FZE	Freeze sound

“ALL” toggle actuates these functions on all 5 sounds, simultaneously
Toggles 1 through 5: Controls the Pause/Solo/STX/FZE functions for each sound

TIME	TIME expansion/compression. Default value= 1.0; Maximum Time Expansion/Compression = +/- 4.0; Negative values reverse sound RESET: Resets TIME to default value
VOL	Volume of the sound. Default value =0.75 RESET: Resets VOL to default value

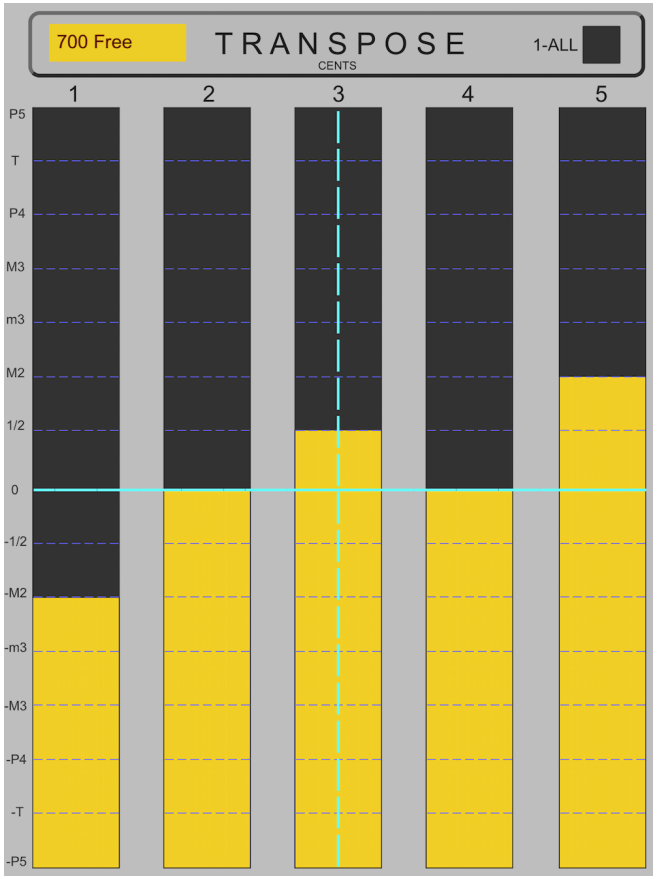


“ALL” number box changes the TIME and VOLUME amounts on all 5 sounds, simultaneously. Number boxes 1 through 5: Control the TIME and volume amount for each sound

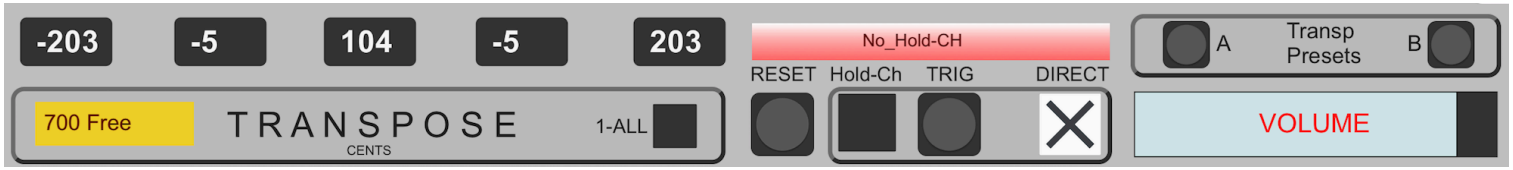
PERFORMER 1 – MIRA GUI Instructions

5 Transposition Faders:

Horizontal blue line, in the middle of the faders, represents position with *No Transposition*
Faders are numbered 1 through 5, each respectively controlling the transposition of sounds 1 through 5



PERFORMER 1 – MIRA GUI Instructions



700 Free Range and type of transposition – Click to get a menu to choose one of 4 options:

200 Quant: Range = 200 Cents up or down (Major 2nd up or down); Type = Quantized to half steps
200 Free: Range = 200 Cents up or down; Type = Free transposition
700 Quant: Range = 700 Cents up or down (Perfect 5th up or down); Type = Quantized to half steps
700 Free: Range = 700 Cents up or down; Type = Free transposition

1-ALL When toggle is checked, first transposition fader moves all 5 faders in synch. All 5 sounds are transposed by some amount

Hold-CH If sounds are played by CIM as point sources, jumping from speaker to speaker, turning on Hold-CH, freezes their spatial location

RESET Resets all sounds to *no transposition*

TRIG For each sound, transposition amounts from respective transposition faders, are only sent out when the “TRIG” button is pressed
Use “TRIG” when “DIRECT” toggle is off.

DIRECT When “DIRECT” toggle is on, transposition values from any of the fader’s values are immediately sent to respective sounds

VOLUME Fader controls the volume of all 5 sounds, simultaneously

Transp Presets Two pre-defined transposition presents available. Click on (A) and (B) buttons to directly jump to those transpositions

PERFORMER 2 – Performance Instructions

Performer 2 Controls:

- The main surround software (CIM)

- the automatic spatial patterns (2nd movement of the piece)
- The Doppler effects (3rd movement of the piece)

Shares control of time-flow of the piece

PERFORMER 3 – Performance Instructions

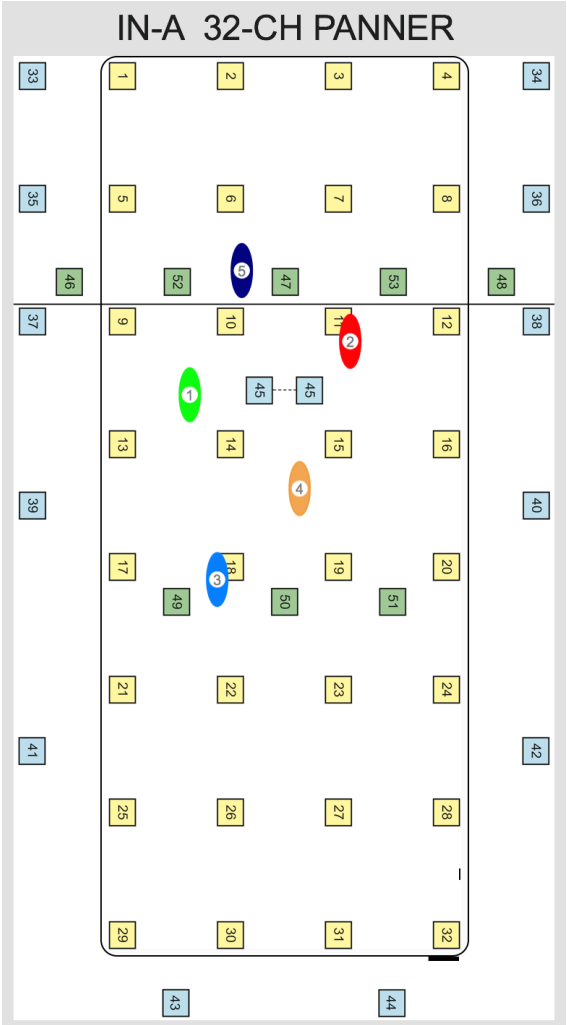
Performer 3 Controls the spatial location of the five vocal sounds played by Performer 1, using a game controller. (Game controller app hosted within CIM software)

The graphic interface depicting the location of the 5 vocal sounds is shown in the figure on the right. The interface is part of the CIM software

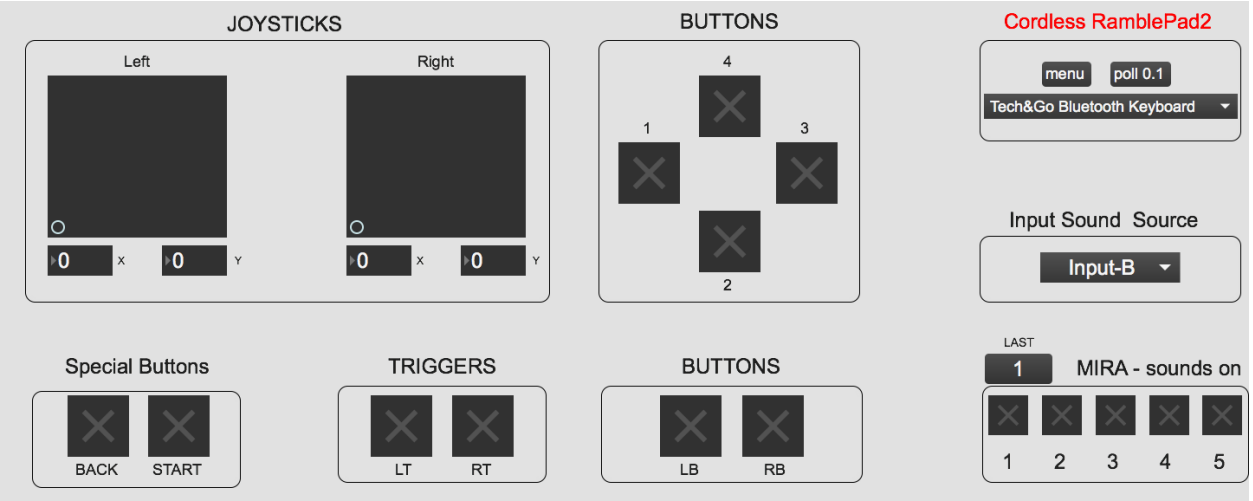
Therefore, Performer 3 needs to sit close to Performer 2 as s/he controls the CIM software environment

The game controller app has its own interface and it needs to be opened so that the controller can be properly identified by MAX/CIM and selected for use

See next page for the explanation of how the game controller can define the sound trajectories of the 5 vocal sounds



PERFORMER 3 – Performance Instructions



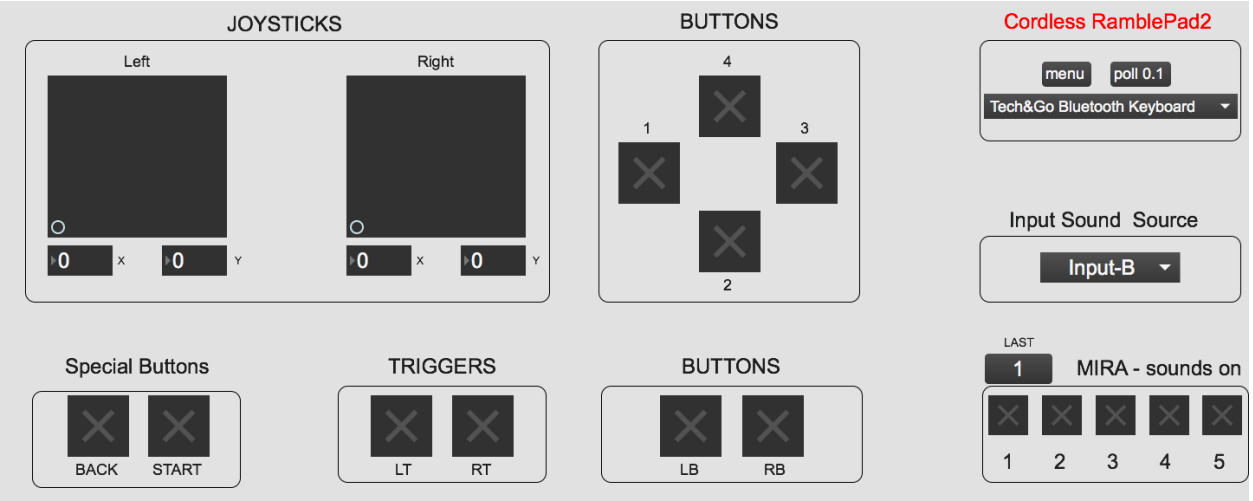
SELECT controller – On the upper right side, click on "menu" to generate list of available devices. Performer 3 then selects "Logitech Cordless Ramble Pad 2"

AWAKE controller – If controller goes to sleep, simply press any button to wake it up

MIRA Sounds ON – The lower right side of the app interface provides useful information about what vocal sound Performer 1 is currently playing. If more than one sound is played, it gives feedback about the very last sound that was triggered.

See next page for the explanation of how the game controller can define the sound trajectories of the 5 vocal sounds

PERFORMER 3 – Performance Instructions



The game controller allows the following types of spatial manipulation:

- Smooth panning of each of the 5 vocal sounds in X/Y space
- Fast point-source location/displacement of each the 5 sounds

- Simultaneously group panning of all 5 sounds
- Simultaneously point-source location of all 5 sounds

PERFORMER 3 – Performance Instructions

LEFT JOYSTICK
– The X/Y position of a sound is determined by the position of the Left Joystick

BUTTONS X, A, B, Y and Right-Back button
– Buttons X, A, B and Y represent sounds 1 through 4 respectively
– Right-Back button represents sound 5

Attention:
In the graphic interface shown in the previous page, sounds 1 through 5 are represented as nodes 1 through 5 respectively

Smooth panning of each of the 5 vocal sounds in X/Y space

Example - Control panning of vocal sound 1:

- Move Left Joystick to node 1 (which represents vocal sound 1)
- Then, Hold down the X button while you move the sound with the left joystick to the new desired location
- Let go of the X button to stop controlling its spatial position

Apply the same sequence of steps to smoothly and independently move vocal sounds 2 through 4, using buttons A,B,Y
And use the Right-Back button to move vocal sound 5

PERFORMER 3 – Performance Instructions

Fast point-source location/displacement of each of the 5 sounds

Example - Control fast point-source position of vocal sound 1:

- Move Left Joystick to whatever X/Y position in the graph-space you want the sound 1 to go to, then, just press button X once

Apply the same sequence of steps for quick point-source location of vocal sounds 2 through 4, using buttons A,B,Y;
And the Right-Back button to move vocal sound 5

Simultaneously group panning of all 5 sounds

- Move Left Joystick to the X/Y position in the graph-space where node 1 (vocal sound 1) is located, then,
- Hold down LEFT BACK button, plus
- Hold down BUTTON X
- Now when you move the Left Joystick, all 5 sounds will move in tandem

Simultaneously point-source displacement of all 5 sounds

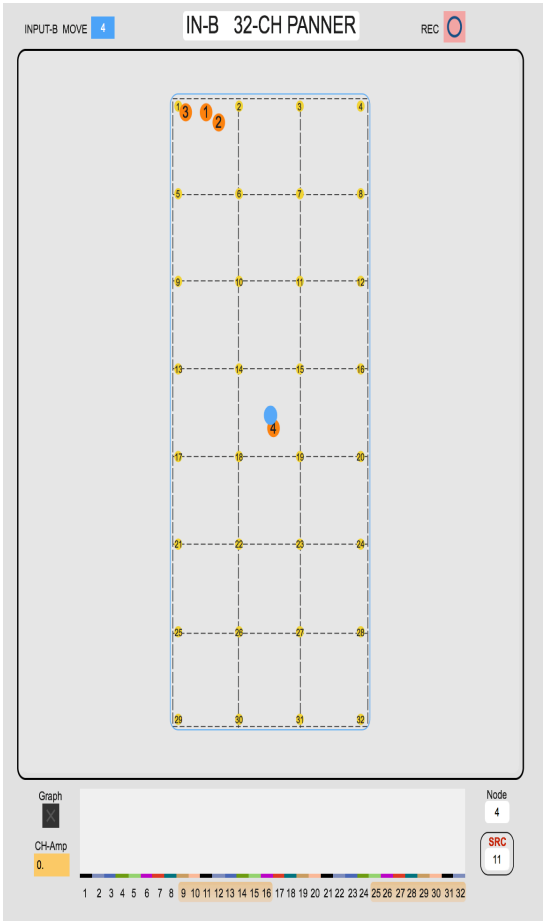
- Move Left Joystick anywhere in the graph-space, then,
- Hold down LEFT BACK button, plus
- Press BUTTON X once

PERFORMER 4 – Performance Instructions

Performer 4 uses a game controller to navigate the spatial trajectories of two different audio loops that are played in Logic Pro, and then piped into CIM. (Logic Pro is handled by Performer 2's computer)

- The first sound is a recording of the Apollo 16 space mission
- The second sound is a recording of a helicopter hovering

The graphic interface depicting the location of the 2 sounds is shown in the figure on the right. The interface is part of the CIM software, therefore, Performer 4 also needs to sit close to Performer 2 as s/he controls the CIM software environment

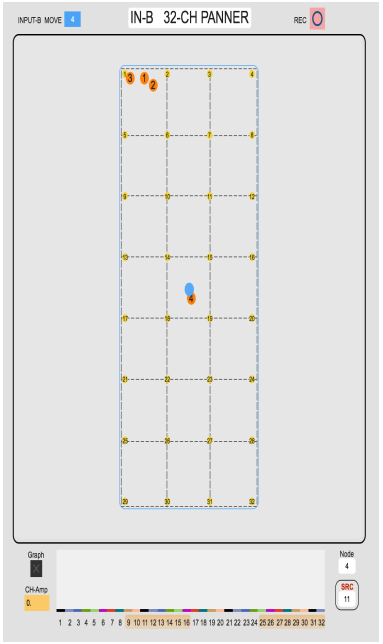


This second game controller has its own independent app, with an interface similar to the one previously shown.
Here too, the app needs to be opened for the controller to be properly identified by MAX/CIM and selected for use

SELECT Controller – On the upper right side, click on "menu" to generate list of available devices and then select "Logitech Dual Action"

PERFORMER 4 – Performance Instructions

Smooth panning of each of the audio loops in X/Y space



For these two audio loops only smooth and separate panning is allowed.
The process for moving the sounds is identical to what was described for Performer 3:

LEFT JOYSTICK
– The X/Y position of the audio is determined by the position of the Left Joystick
– Button X represents Loop 1 (Apollo Mission)
– Button A represents Loop 2 (Helicopter)

Example - Control panning of loop 1:

- Move Left Joystick to node 1 (which represents loop 1)
- Then, Hold down the X button while you move the sound with the left joystick to the new desired location
- Let go of the X button to stop controlling its spatial position

Apply the same sequence of steps to smoothly and independently move loop 2 using button A

IMPORTANT – The space-graph used for these two loops includes motion that goes beyond the walls of the concert hall (in the X dimension)
This allows the sounds to be silenced and provides a way for Performer 4 to have effective control of the sound's amplitude

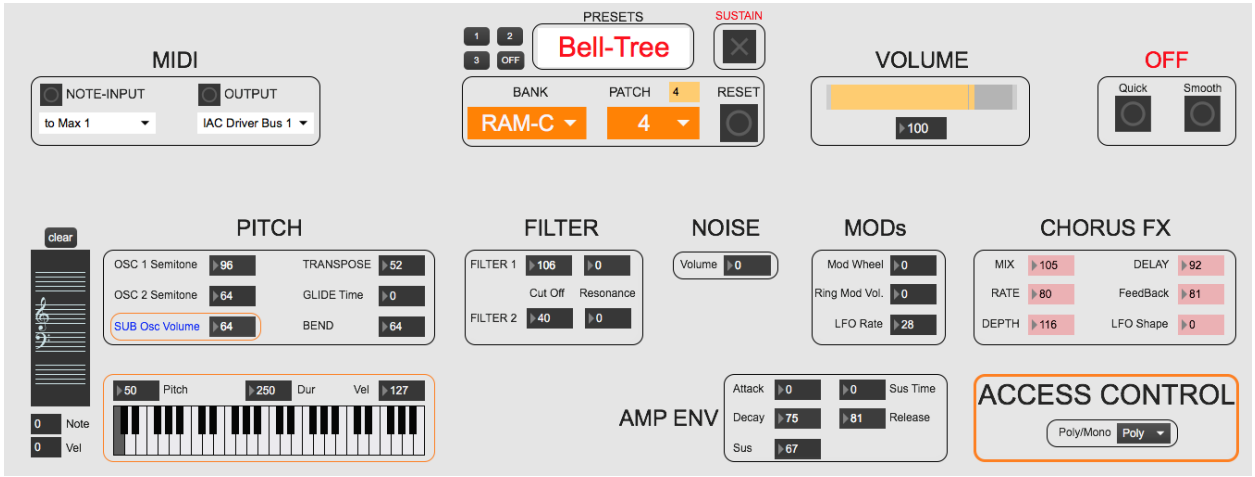
PERFORMER 5 – Performance Instructions

Performer 5 plays two different synth sounds from an Access Virus hardware synth. S/he does so using a Kbd controller and a laptop running MAX

Using a specific software app – “Access Control” - Performer 5 does real-time processing on those sounds.
“Access Control” is an independent app that lives in Performer 5’s computer

The two synth sounds used by Performer 5 five are called “Bell-Tree” and “BassPulse”
They are easily called up by respectively clicking on the small boxes numbered 2 and 3, which are located to the left of large menu with the name of the sounds.

By default the app starts up with “No-Sound” loaded, and any notes input via either a MIDI controller of via the virtual kbd, will have no effect



PERFORMER 5 – Performance Instructions

MIDI Section

Click on the buttons for “Note Input” and “Output” to respectively

- select the MIDI controller being used to provide note information to the Access Virus synth and to
- define what MIDI interface and port are being used to send MIDI messages to control the synth

VOLUME fader

Defaults to value 100 – Advisable to change it to its maximum of 127

SUSTAIN

Turning on “Sustain” allows hands free operation of the app’s parameters

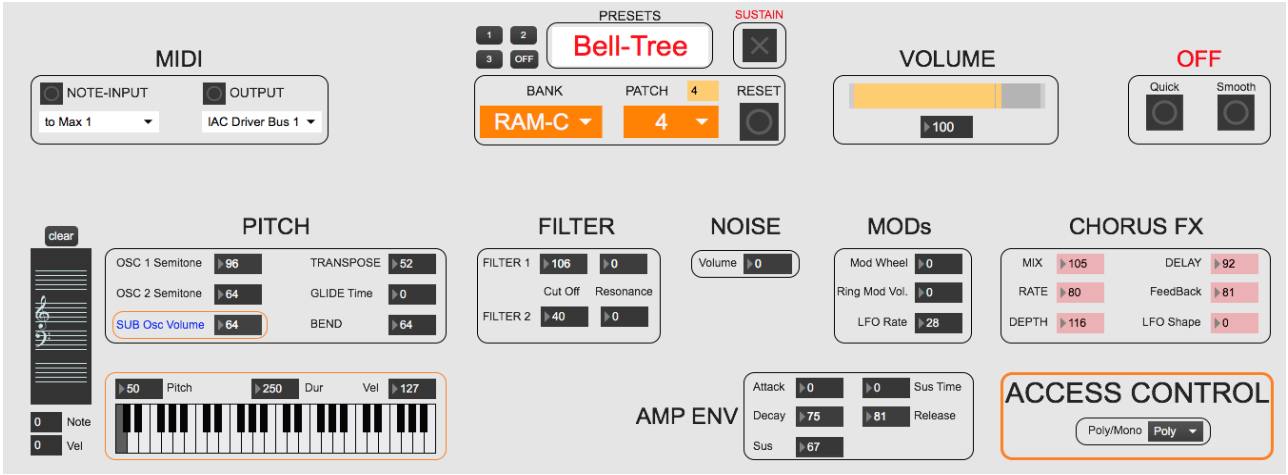
RESET

Click “Reset” button to recall the sound’s default parameters. *Attention - SUSTAIN is turned off when a sound is reset*

OFF

Turn off all notes being played

- Quick – Super fast way to turn all sounds off (proprietary for Access Virus Synthesizers)
- Smooth – Less fast but smooth transition to no sound (Advisable to use!)



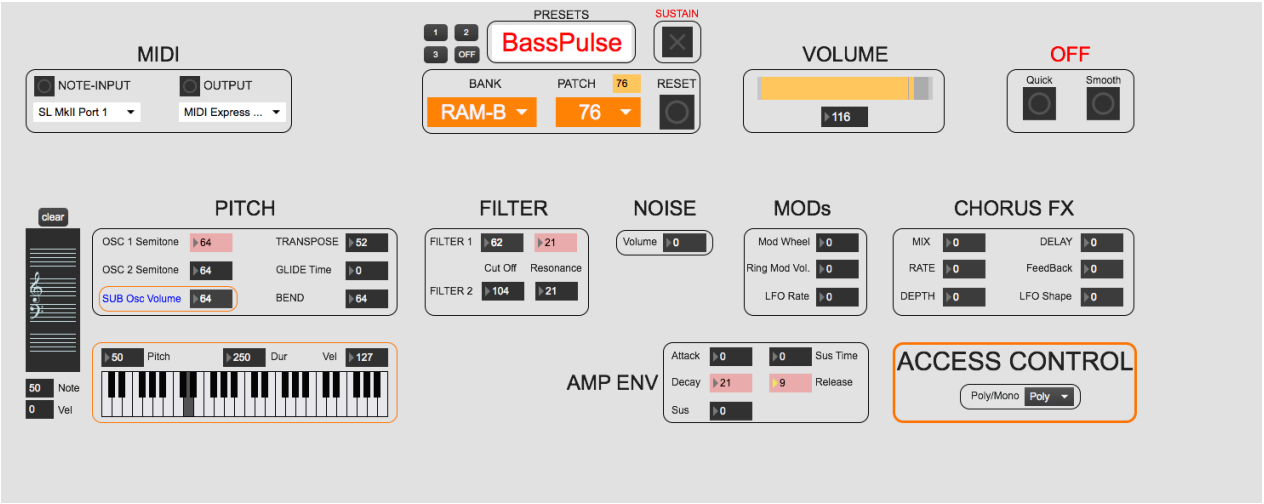
PERFORMER 5 – Performance Instructions

AUDIO Processing Modules – PITCH; FILTER; NOISE; CHORUS FX; AMP ENV
For each selected sound, the parameters best suited for real-time audio processing are highlighted in pink color.
When the selected sound is changed, so will the targeted parameters for audio-processing

VIRTUAL KBD Module
The virtual keyboard is useful if no physical MIDI hardware controller is available.
To play notes one can:

- Enter MIDI note numbers in the leftmost number box above the virtual keyboard, or
- Click directly on the virtual kbd

If the notes are input using the number box, one can pre-define the duration and the MIDI velocity for those notes.
Use the number boxes above the virtual kbd, respectively in the center and on the right



PERFORMER 5 – Performance Instructions

Access Virus: Bell-Tree (RAM-C, 4), (Sound #2) – PARTS I and III

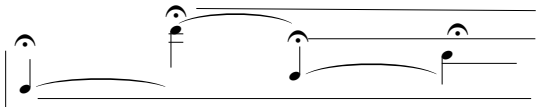
Access Virus: BELL-TREE (Sound 2 - RAM-C, 4)

Bell-Tree Pointlistic Motives

– Pitches are detuned, focus on sound rather than absolute pitch
– Pitches are chosen ad libitum, but must follow pitch contours
– Implement Mirroring and Retrograde versions of pitch points
– Tempo is variable: Allow temporal elasticity of propotional notation

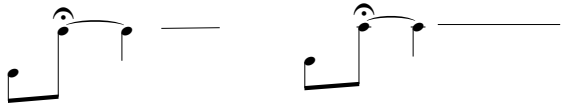
– Bell-Tree motives are free flowing, high-pitched, contrasting, luminous, point-like units
– Start by playing groups 1 through 4, in order, then freely combine groups
– Each group can be repeated freely
– Processsing to be used after the groups are clearly presented and if musically justifiable

Group 1 - 4 notes



Group 2 - 2 notes

Group 3 - Two 2-note groups



Group 4 - 1 note

Group 4 - 1 note

Group 5 - Two 4-note groups

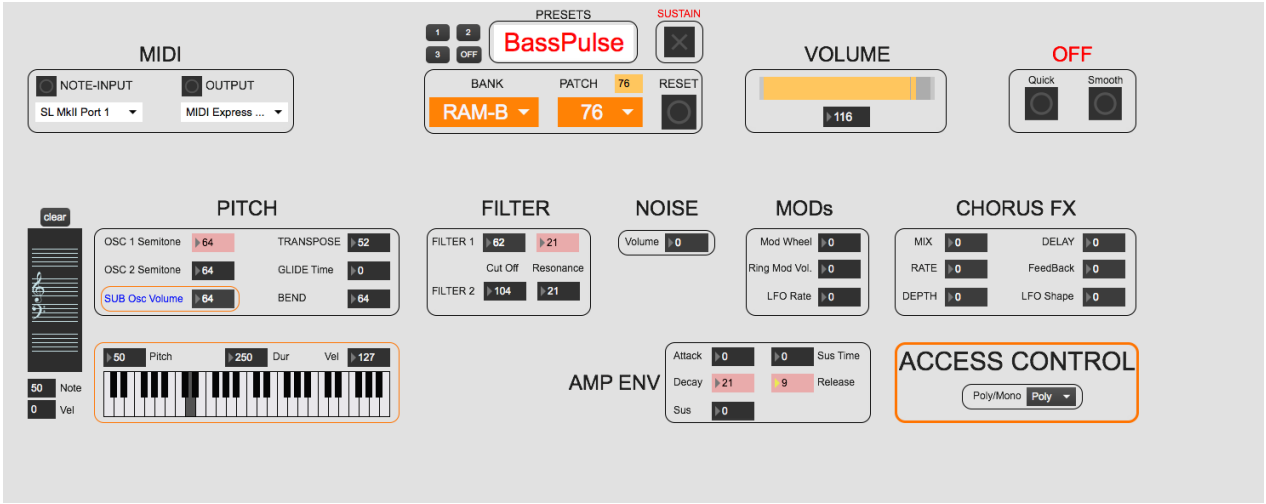
Group 6 - Two 5-note groups

PERFORMER 5 – Performance Instructions

Access Virus: Access Virus: Bass-Pulse (RAM-B, 76), (Sound #3)
PART II – Varied Sweeping Filter Effects

FILTER #1 RESONANCE to sweep from 21 to 127
Filter F1 Cut Off to sweep from 62 to 90

<u>Play around with</u>:
OSC 1 Semitone values, from 76 to 112, for added pitch-overtone focus-coloration



PERFORMER 5 – Performance Instructions

Access Virus: Bass-Pulse (RAM-B, 76), (Sound #3)
PART II – Switch Overtone Focus

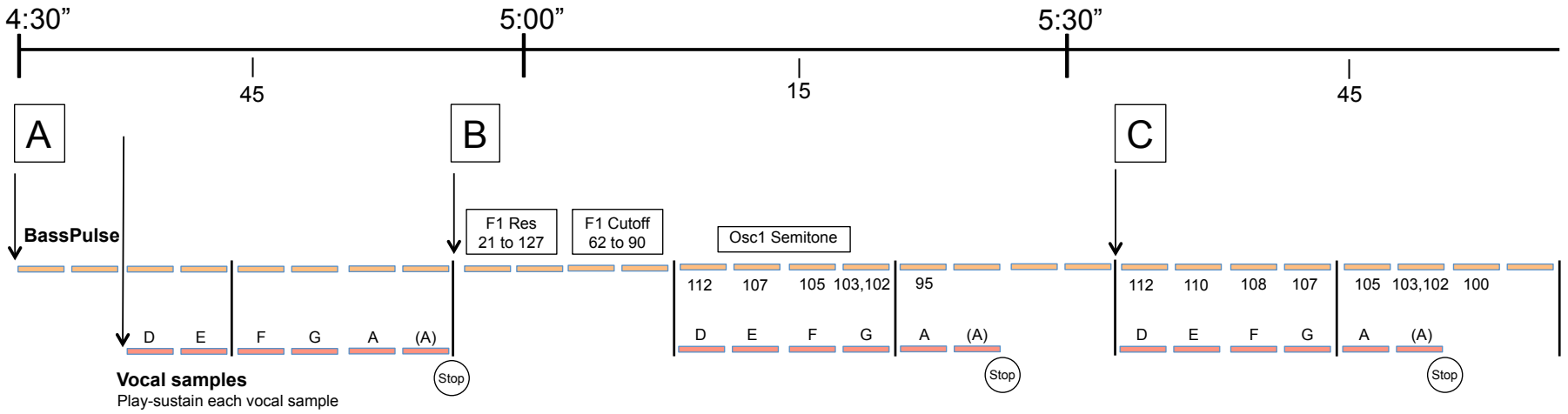
SET:
Resonance to 127
Filter Cut off to 90

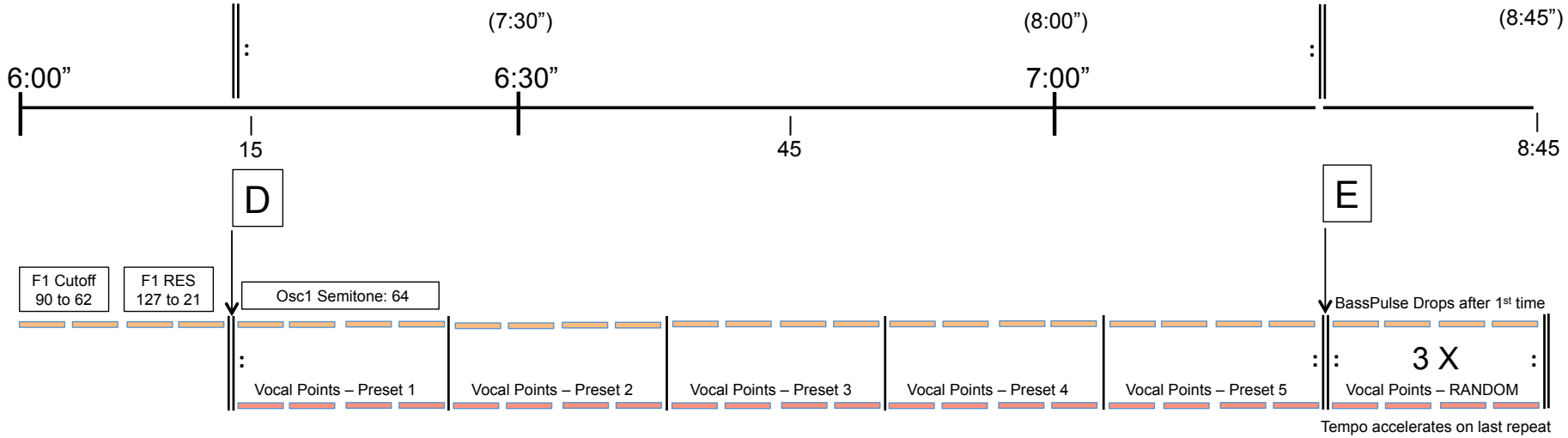
Play around with:
OSC 1 Semitone values from 76 to 112 (anything > 112 has no further effect)
See *Number-to-Pitch correspondence chart*

	D	D#	E	F	F#	G	G#	A	A#	B	C	C#
Default Octave	76	77	78	79	80	81	82	83	84	85	86	87
1 Oct Up	88	89	90	91	92	93	94	95	96	97	98	99
2 Oct Up	100	101	102	103	104	105	106	107	108	109	110	111
3 Oct Up	112											

The Scent of Elysium – PART II: Details for BassPulse (Performer 5) + Vocal samples (Performer 1)

BassPulse : BPM = 67; each depicted block contains a 4-beat measure; Block duration is approx. 3 seconds; Each 'bracket' contains 4 blocks/measures





PERFORMER 6 – Performance Instructions

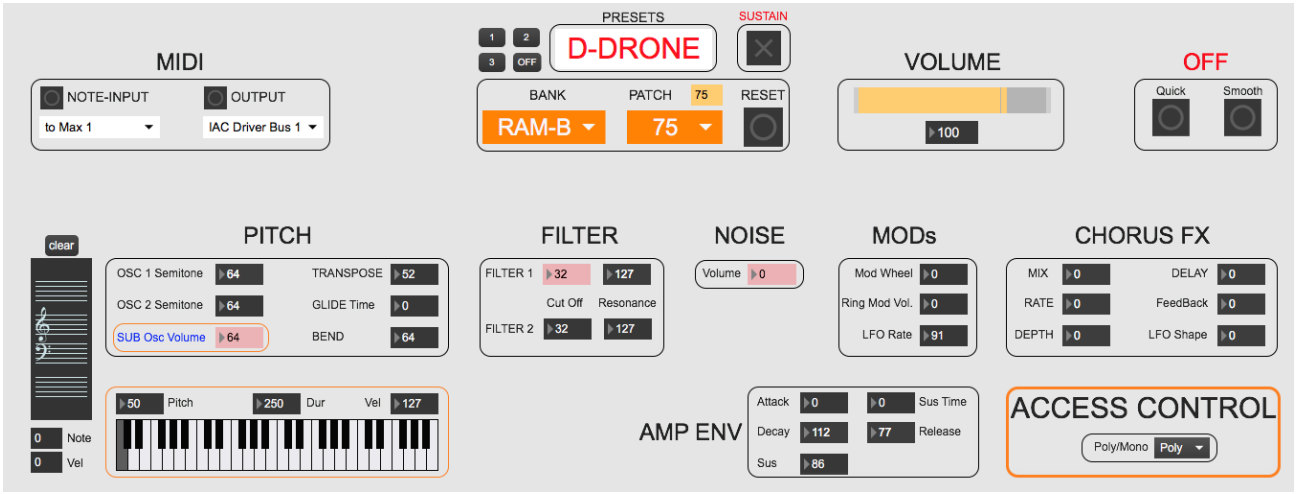
Performer 6 plays just one synth sound from a second Access Virus hardware synth, using a laptop running MAX

Here too, the same specific software app – “Access Control” – will allow Performer 6 to do real-time processing on that sound. (“Access Control” app lives within Performer 6’s computer)

The synth sound used by Performer 6 is called “D-Drone”. This sound is called up by clicking on the small “number 1” box located to the left of the menu with the large name of the sounds. It is a drone-like sound, based on a single D note (MIDI note 50)

This drone-like sound, is played only once , at the beginning of the piece and stays throughout. Therefore there is no need to use a MIDI Kbd controller to change notes. It will be sufficient to manually input the note number or use the virtual kbd to trigger it.

Prep the sound by: Switching Sustain On; Bumping up volume to 127; and then manually inputting MIDI note 50



PERFORMER 6 – Performance Instructions

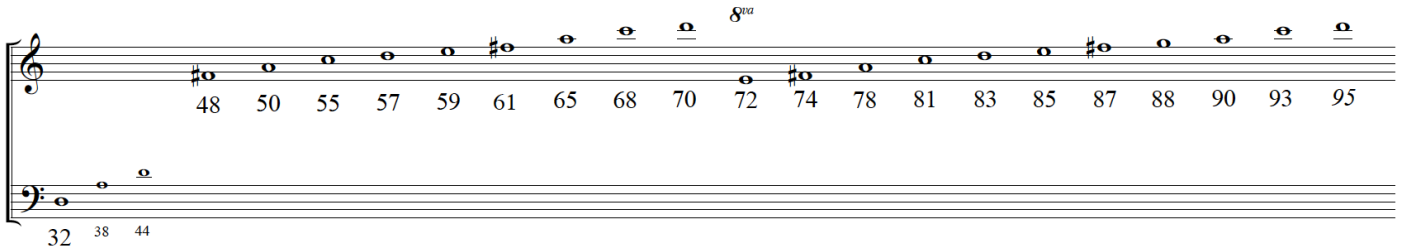
As stated before this sound plays throughout the three movements of the composition, but its most important function happens in the first movement.
It quietly starts the piece and slowly swells in and out, providing the sonic canvas above which all other sounds are layered upon

This drone sound will be filtered with a temporal flow to be done ad-libitum, but the filter cutoff settings and the values used for the filtering effects follow a strict map of values. Those values are meant to bring out specific overtones of the D note (146.8 Hz) harmonic series. In the first movement, the swelling of the overtone frequencies will play an important role in establishing a dialogue with the pitches of the five vocal sounds played by Performer 1.

See the map below: Filter F1 Cut-off value amounts – Correspondence with pitch overtones

Access Virus: SOUND-1 (RAM-B, 75)

Filter F1 Cutoff amounts > to bring out concrete pitch-overtones



32 – Performer 6 Info

Scent of Elysium – PART I

Performer 6: Synth-2, D-Drone

D-Drone | Section A

D-Drone is triggered by playing MIDI note 50, a low D, and sustained throughout the piece
It contains a gentle, cyclic amplitude beating, making it "follow" a **BPM of 57**
Work starts with 2 "measures" (about 8 seconds) of the D-Drone, without any changes

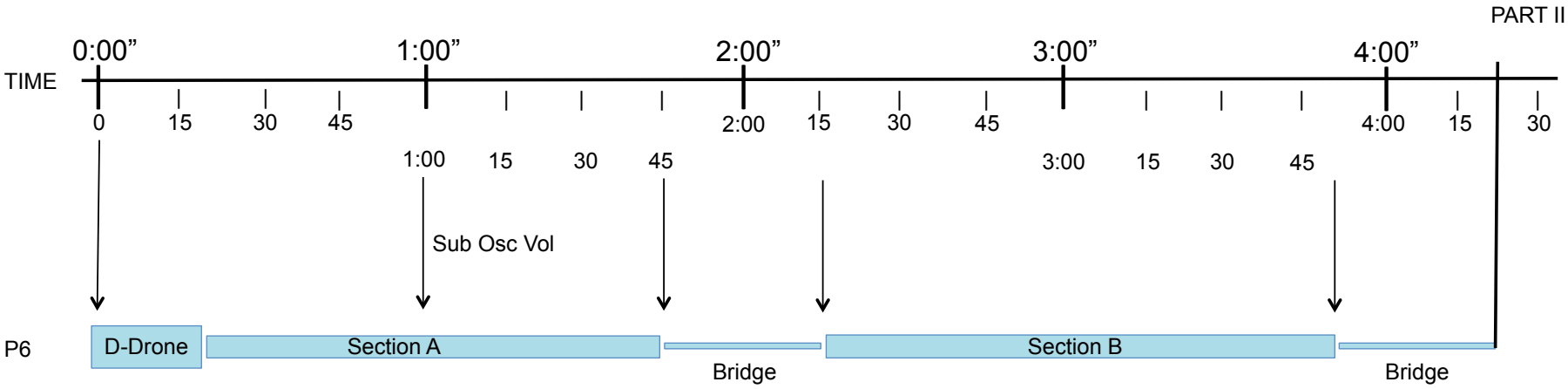
In Section A overtones will vary between F#: cut off=32, and D: cut off=70
Overtones are reached at by smoothly increasing and decreasing F1 cut off values.
Selected overtones should be sustained long enough to be clearly heard.
Overtone selection goes up and down in frequency but STEADILY moves upwards
End of Section A should feature overtone D, cut off=68
At around time= 1:00" bring up Sub-Osc volume, from 64 to 127

Bridge

D-Drone returns to its original parameters. Cut off = 32, to bring the low D note. The Bridge provides contrast, reducing the color-spectrum of the sound and regaining simplicity

Section B

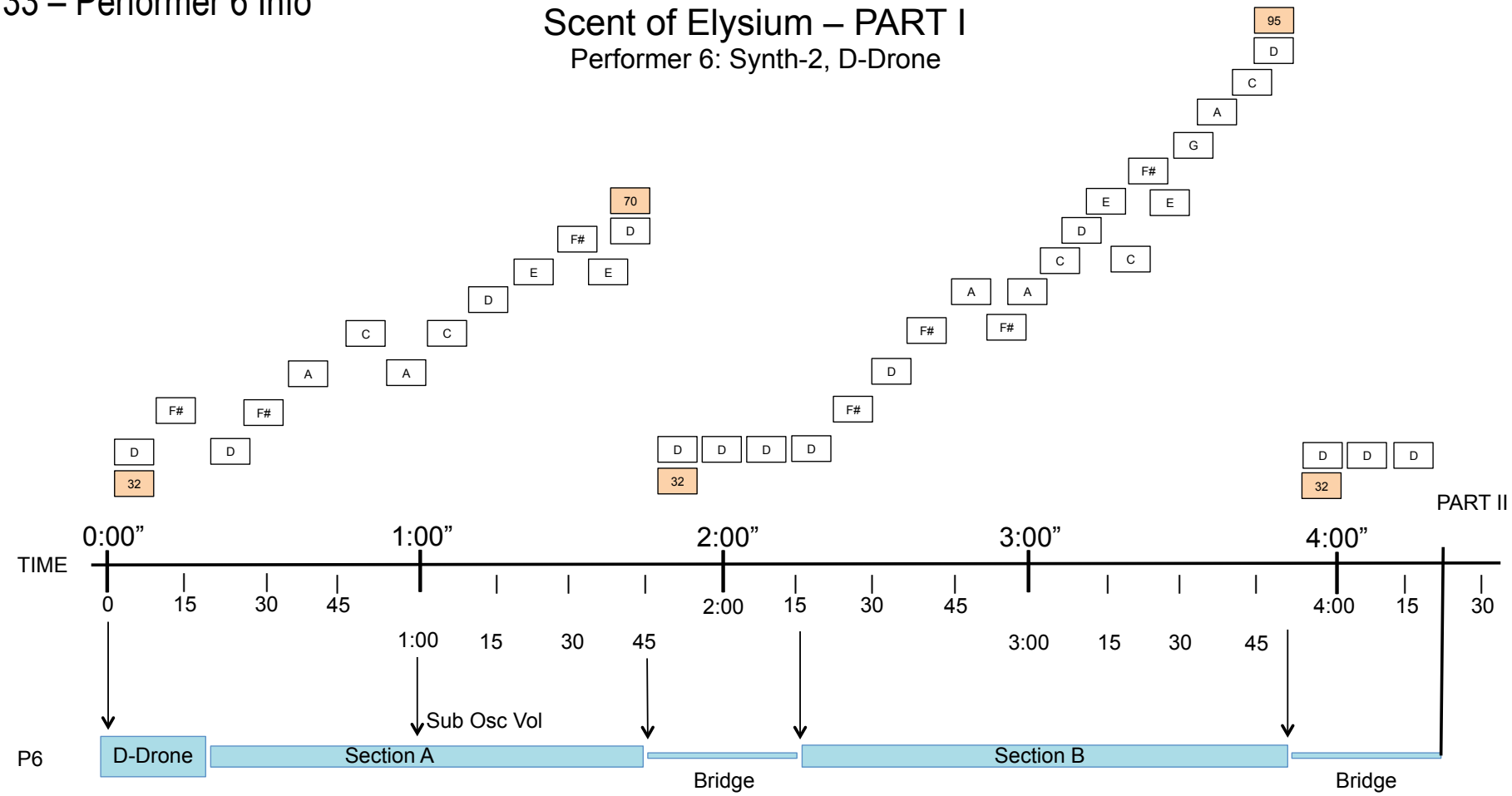
Overtones will vary between F#: cut off=48, and C: cut off=95
Emphasis on higher overtones, for richer and louder harmonics
Broader range sweeps and faster changes of overtones
Section B builds up to reach high overtone of D: cut off=95, prior to second "Bridge"

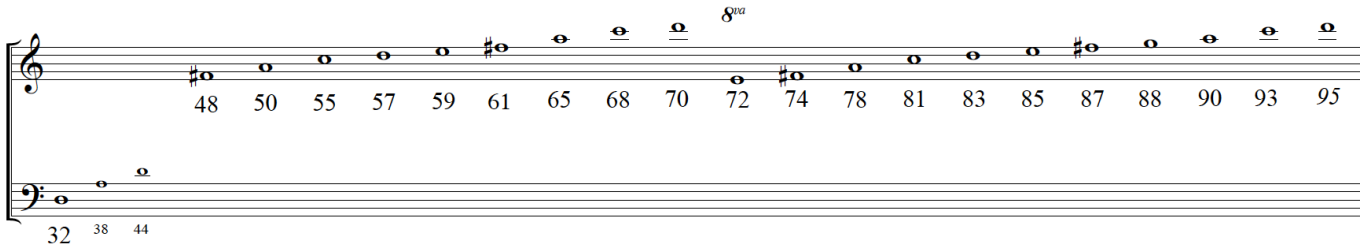


33 – Performer 6 Info

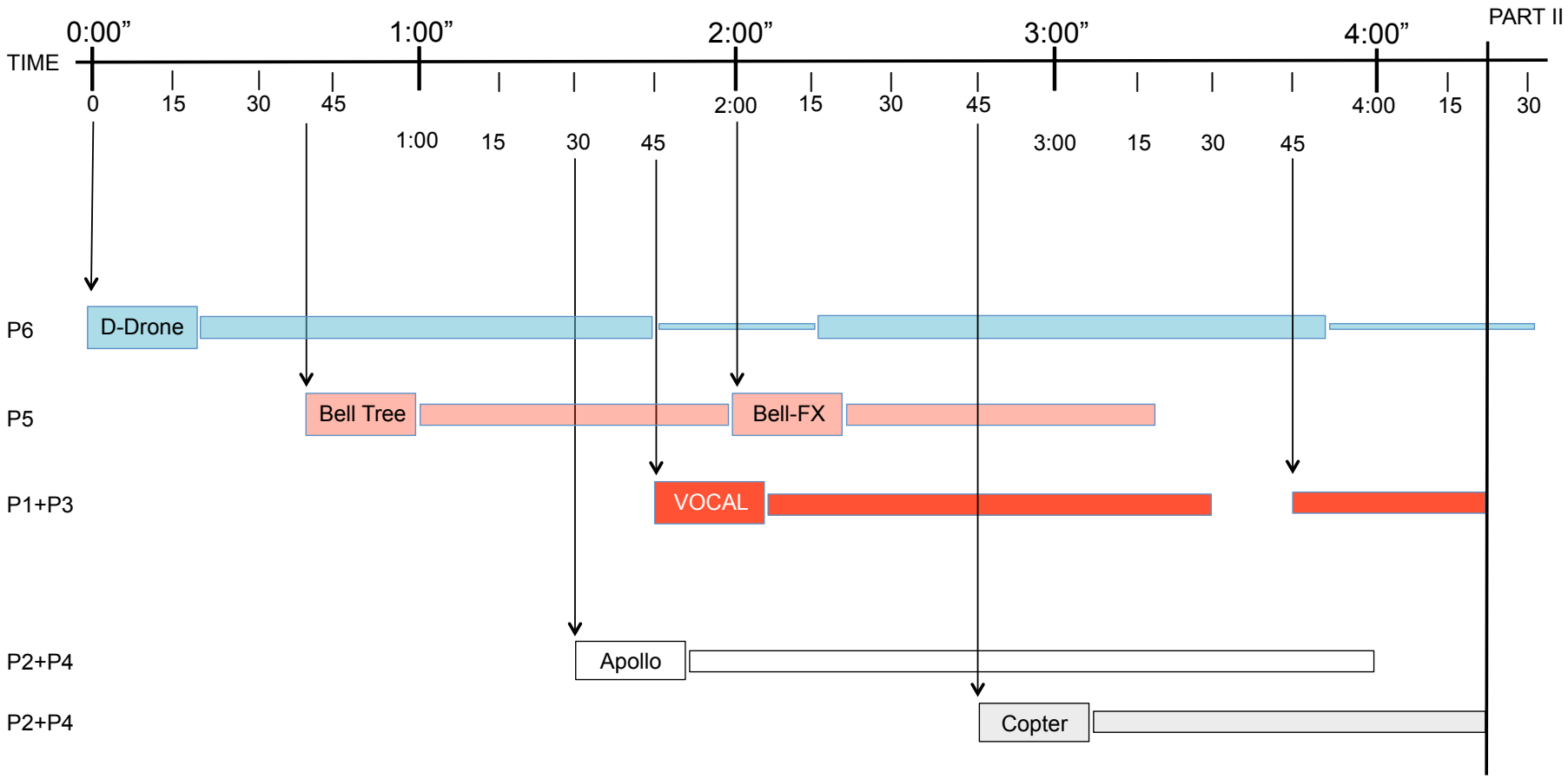
Scent of Elysium – PART I

Performer 6: Synth-2, D-Drone

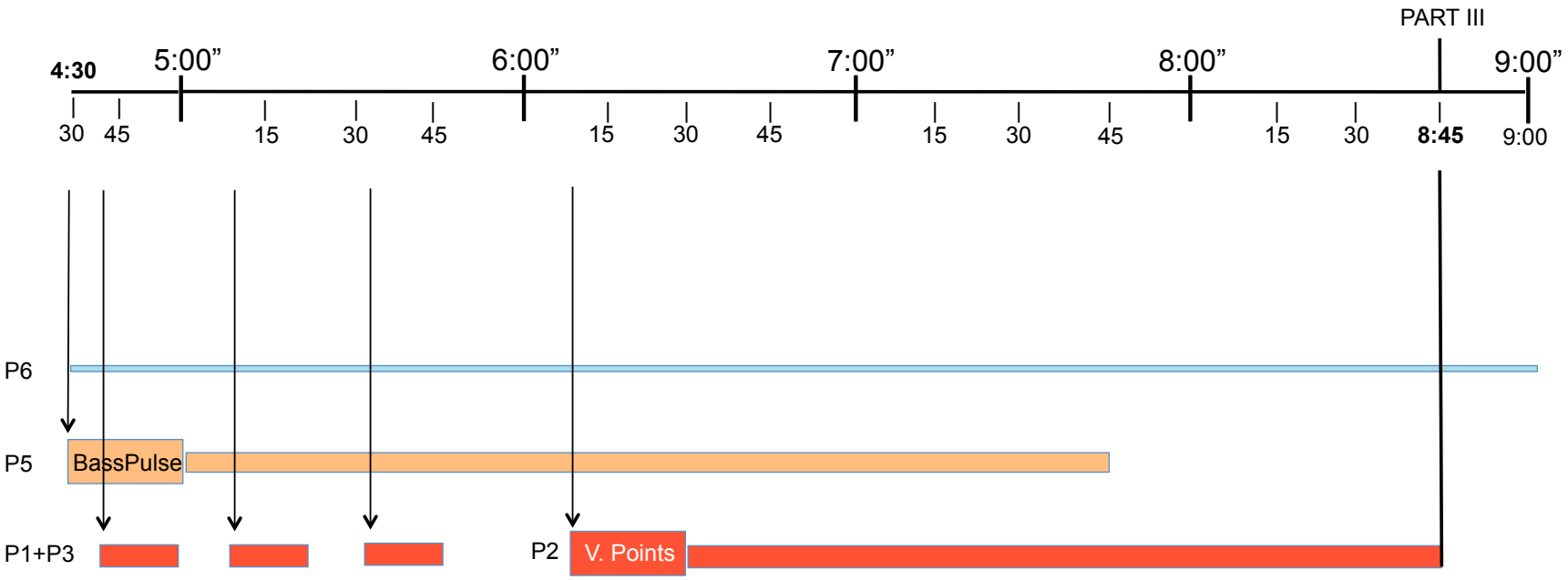




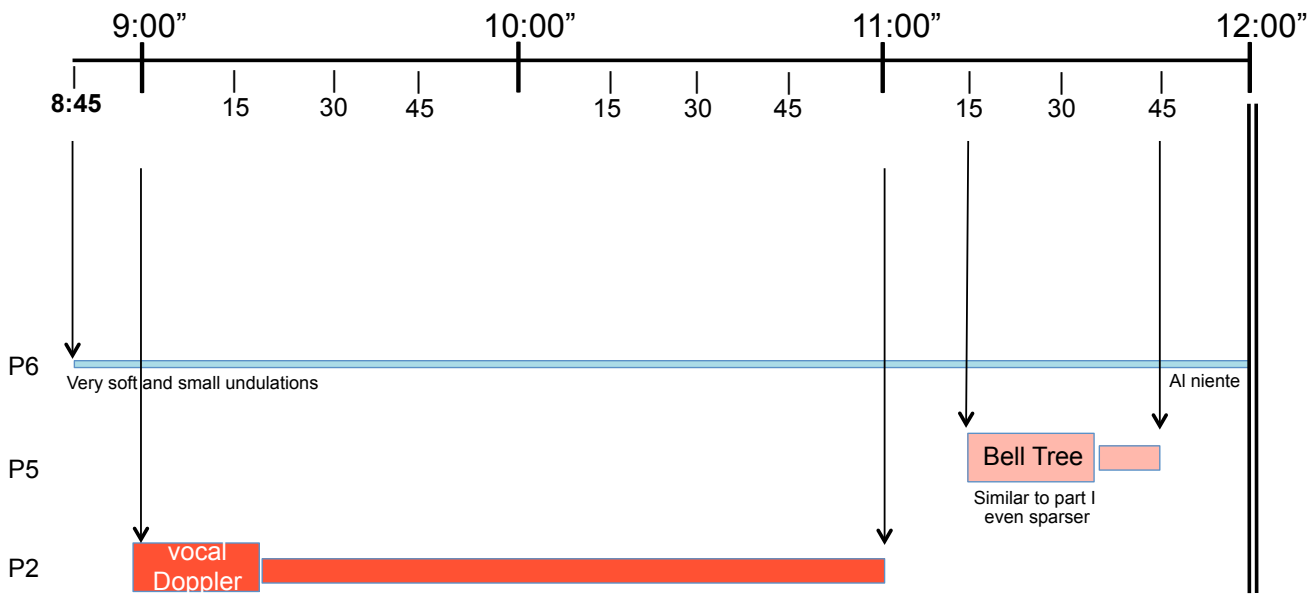
The Scent of Elysium – PART I



The Scent of Elysium – PART II



The Scent of Elysium – PART III



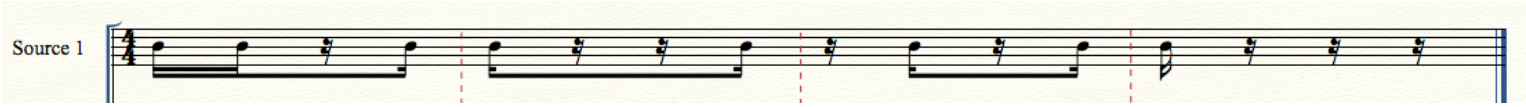
DESCRIPTION of AUTO PRESETS 1, 2, 3, 4 (16-step presets)

37 – Part II
Point-source Presets

Automatic Preset 1

- All 5 voices (sources 1 through 5) follow the rhythm of source 1 from "5-layer Rhythm-1"
  Point-source location channels, running along row 1 of the 8 (AFC) right-most speakers in the Hall move as follows:

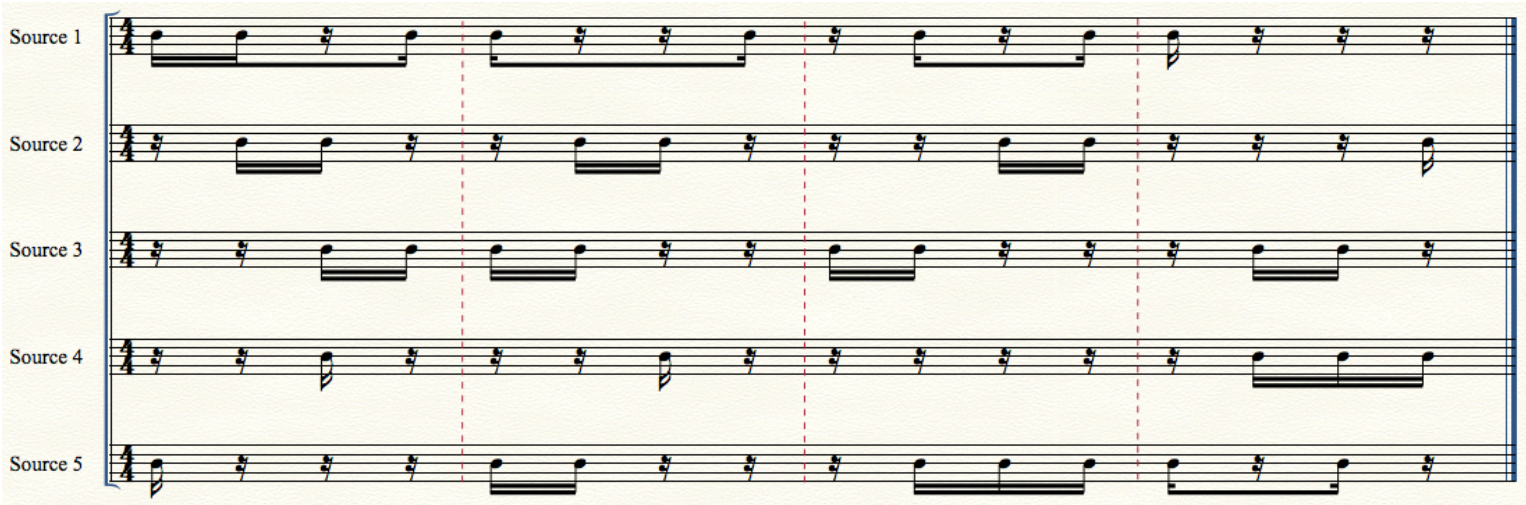
Chs: 1 5 9 13 17 21 25 29



Automatic Preset 2

- Voices 1 through 4 (sources 1-4) respectively follow rhythms of sources 1 through 4 of "5-layer Rhythm-1". Each voice following a spatial path in a separate row of the AFC channels in the Hall
- Voice 5 (source 5) using rhythmic source 5, bounces back and forth within speakers of the Hall's column five

Chs:	1	5		9	13			17		21		25	29			
Chs:		2	6			10	14				18	22				26
Chs:			3	7	11	15			19	23				27	31	
Chs:			4				8							12	16	20
Chs:	17				18	19				20	17	18	19		20	

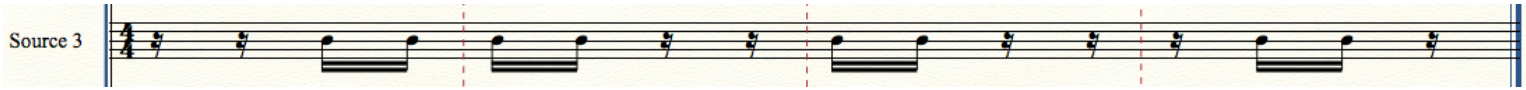


38 – Part II
Point-source Presets

Automatic Preset 3

- All 5 voices (sources 1 through 5) follow the rhythm of source 3 from “5-layer Rhythm-1”
  Point-source location channels, bounce between column 1 and column 8 of the Hall, as follows:

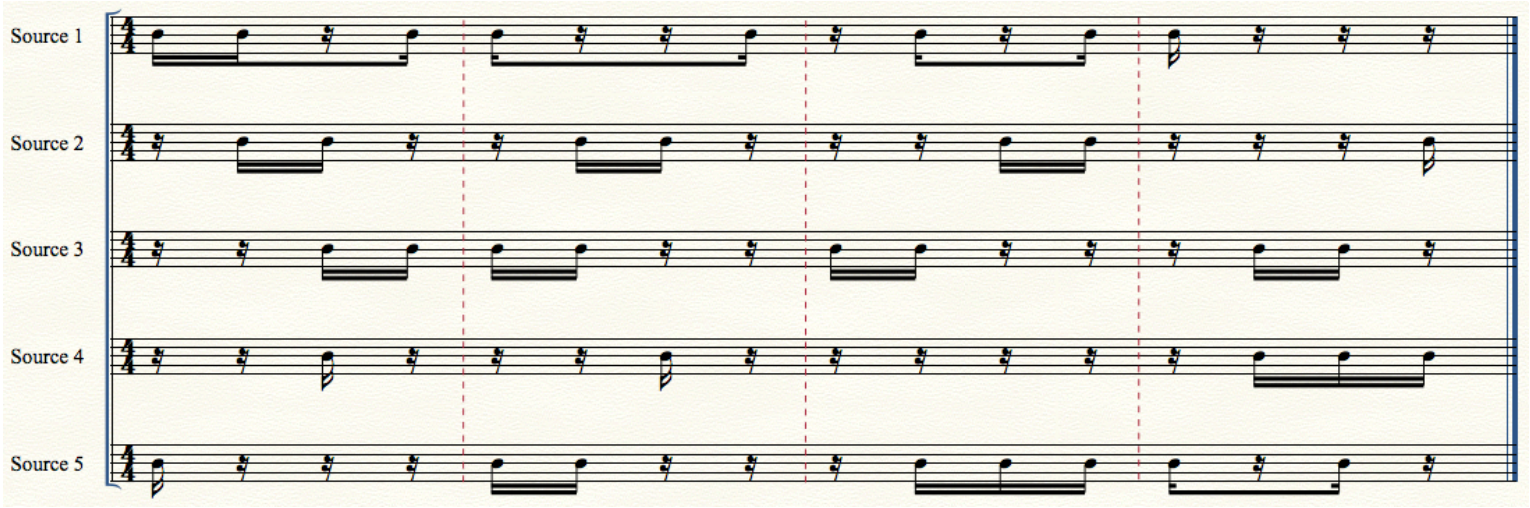
Chs:																
			1	1	1	1			29	29				29	29	
			2	2	2	2			30	30				30	30	
			3	3	3	3			31	31				31	31	
			4	4	4	4			32	32				32	32	



Automatic Preset 4

- Voices 1 through 5 (sources 1-5) respectively follow rhythms 1 through 5 of “5-layer Rhythm-1”.
- All 5 voices are located in one single spatial location: channel 14

Chs:	14	14		14	14			14		14		14	14			
Chs:		14	14			14	14				14	14				14
Chs:			14	14	14	14			14	14				14	14	
Chs:			14				14							14	14	14
Chs:	14				14	14				14	14	14	14		14	



39 – Part II
Point-source Presets

Automatic Preset 5

- Voices 1 through 5 (sources 1-5) respectively follow rhythms 1 through 5 of "5-layer Rhythm-1".
  Location SPREAD – Each sound source stays in one single, separate channel location, but the channels are now spread out from Auto-Preset 4 where all sources shared the same location.
  Point-source location channels are as follows:

Chs:	14	14		14	14			14		14		14	14			
Chs:		24	24			24	24				24	24				24
Chs:			25	25	25	25			25	25				25	25	
Chs:			1				1							1	1	1
Chs:	8				8	8				8	8	8	8		8