VEAE: Virtual Experimental Audio Environment

user's manual

By

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VEAE: Virtual Experimental Audio Environment

Welcome to the colorless world of silence.

Thank you for obtaining a copy of VEAE: Virtual Experimental Audio Environment. In this booklet we will go through from how to setup the game to how to play the game.

1. System Requirements

- 800 MHz processor
- DVD reader
- Soundcard
- Keyboard and mouse
- 32 MB graphics card

2. How to Setup

In the DVD, there are two folders labeled “Mac” and “Win”. Depending on the platform copy the folder to the desired location and double-click on the file named VEAE inside the folder you have copied. Select screen size and detail depending on your hardware configuration.

3. Story

In VEAE is an audio environment, which enables a person to listen music in different locations and through different filters. This allows unique audial experiences that can not be achieved while listening to music from mobile devices through earphones such as listening the music you want at a concert hall anytime you want.

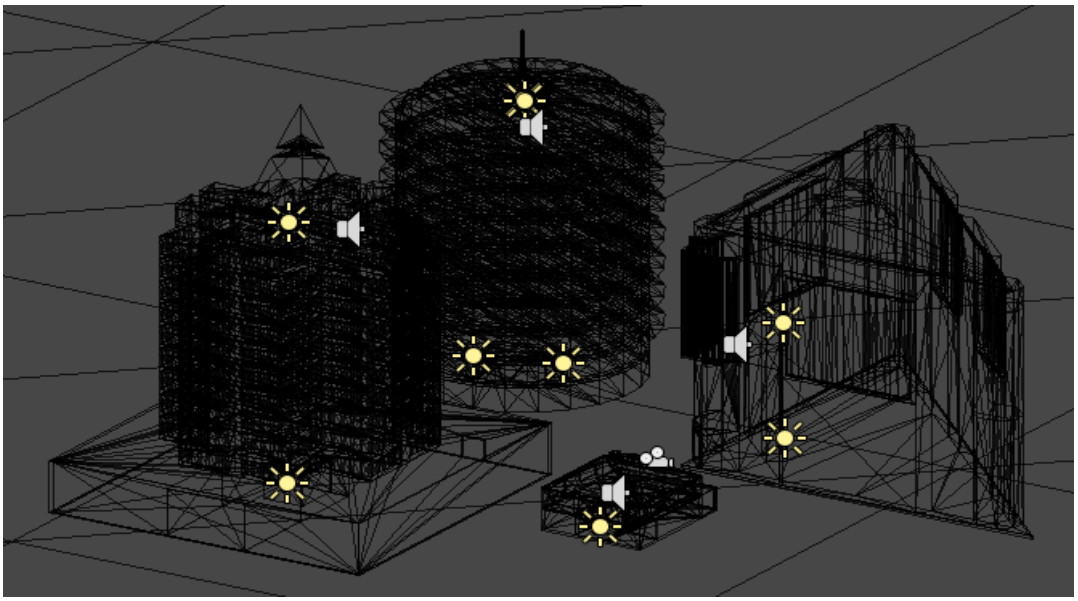

Figure 1: The Virtual Environment

4. The Buildings

The 4 buildings in the game as seen in Figure 1 are modified copies of 4 real buildings from different styles of architecture.

Completed in 1955, the Capitol Records Tower is located in Los Angeles, California and it is home to the recordings of names like Frank Sinatra and Nat King Cole. The building is from futurist style. The original image of the building can be seen in Figure 2.

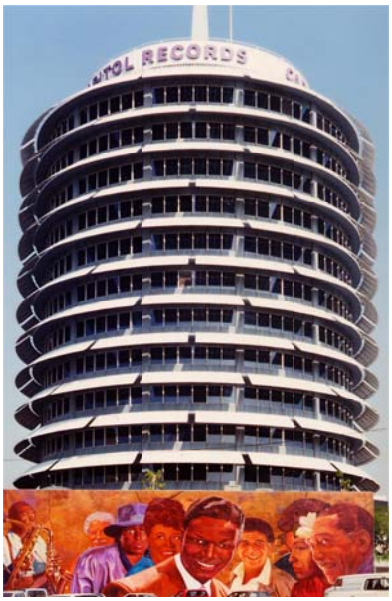

Figure 2: The Capitol Records Tower

The second building is Frankfurter Messeturm in Frankfurt, Germany from Helmut Jahn. The modern looking skyscraper is equipped with a pyramid on the last floor. This building belongs to post-modern architectural style. Figure 3 shows the original building.

Figure 3: Frankfurter Messeturm

The third building is Robarts Library of University of Toronto in Toronto, Canada. The building proudly shows its concrete as well as the angular and repetitive shape. Opened in 1973 the building belongs to brutalist architectural style. Figure 4 shows the actual building.

Figure 4: Robarts Library

The last building recreated in the game is not an actual building. The building is from American foursquare style and was popular between the end of 19th century and the beginning of the 20th century. It has wooden structure and a product of a movement against the heavily designed houses like Victorian style. Figure 5 shows the plan for an American foursquare.

Figure 5: American Foursquare

5. The Music

In this version VEAE can play only pre-loaded songs. These songs are related to the buildings albeit not in the same way.

- Capitol Records Tower: Nat King Cole – Nature Boy

- Frankfurter Messeturm: John Cage – Dream
- Robarts Library: Akira Yamaoka – Betrayal
- American foursquare: The Inkspots - Maybe

Capitol Records and Nat King Cole worked together and the tower is said to be raised with the profits from Cole's songs. Frankfurter Messeturm and John Cage's music are from post-modern style. In the game, Robarts Library is associated with a brutal song from a horror videogame. The Inkspots and the American foursquare are from the same time period.

How to play the songs will be explained under "Gameplay".

6. The Sound Effects

The sound effects that shape how the songs are heard can be divided into two categories. The first part is the room acoustics and the second part is the other effects like low-pass filtering, high-pass filtering, distortion, echo and chorus.

The mapping of the effects of second type are as follows:

- Capitol Records Tower: Echo
- Frankfurter Messeturm: High-pass Filter and Chorus
- Robarts Library: Distortion
- American foursquare: Low-pass Filter

How to control these effects will be explained under "Gameplay". Table 1 summarizes the relation between the buildings, the songs, the audio effects and room acoustics presets.

Building	Architectural Style	Song	Relation	Room Acoustic	Controllable Sound Effect
Capitol Records Tower	Futurist Style	Nat King Cole – Nature Boy	History	Concert Hall	Echo
Frankfurter Messeturm	Postmodern Style	John Cage - Dream	Movement	Psychotic	High-pass Filter and Chorus
Robarts Library	Brutalist Style	Akira Yamaoka - Betrayal	Movement	Carpeted Hallway	Distortion
American Foursquare	Foursquare	The Inkspots - Maybe	Era	Livingroom	Low-pass Filter

Table 1: Relation of Sound and Architecture

7. Gameplay

In this section the controls and the “rules” of the game will be explained.

7.1. Controls

The game is played through first-person point of view. The mouse and the keyboard are necessary for movements and actions.

- W = Move forwards
- S = Move backwards
- A = Side-step left
- D = Side-step right
- Spacebar = Jump
- C = Crouch
- ESC = In-game menu
- Left Mouse-Button = Fire
- R = Activate music box
- Mouse Movements = Looking around

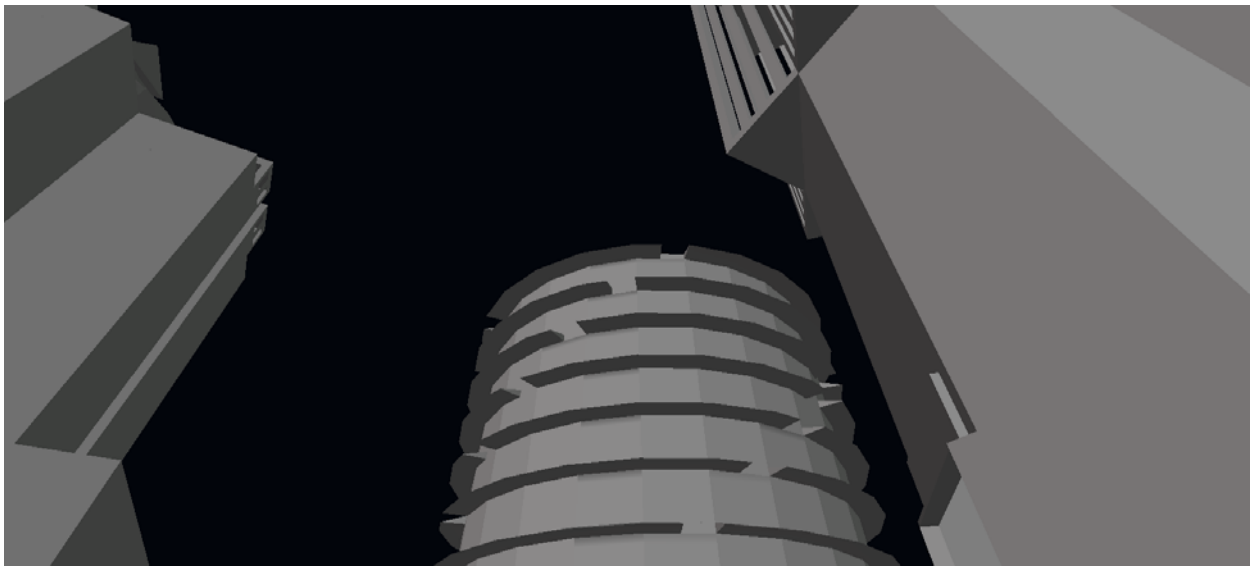

Figure 6: Character Looking at the “Records Tower”

7.2. Objects

The VEAE, as seen in Figure 6, is colorless world except for some objects.

7.2.1 Music Boxes

The music boxes are self-illuminated spheres as seen in Figure 7. They float inside the buildings, and can be activated by pressing “R” once you get the indicator on the top left. To get

the indicator you must go near the boxes. If the box is playing music pressing “R” causes it to stop.

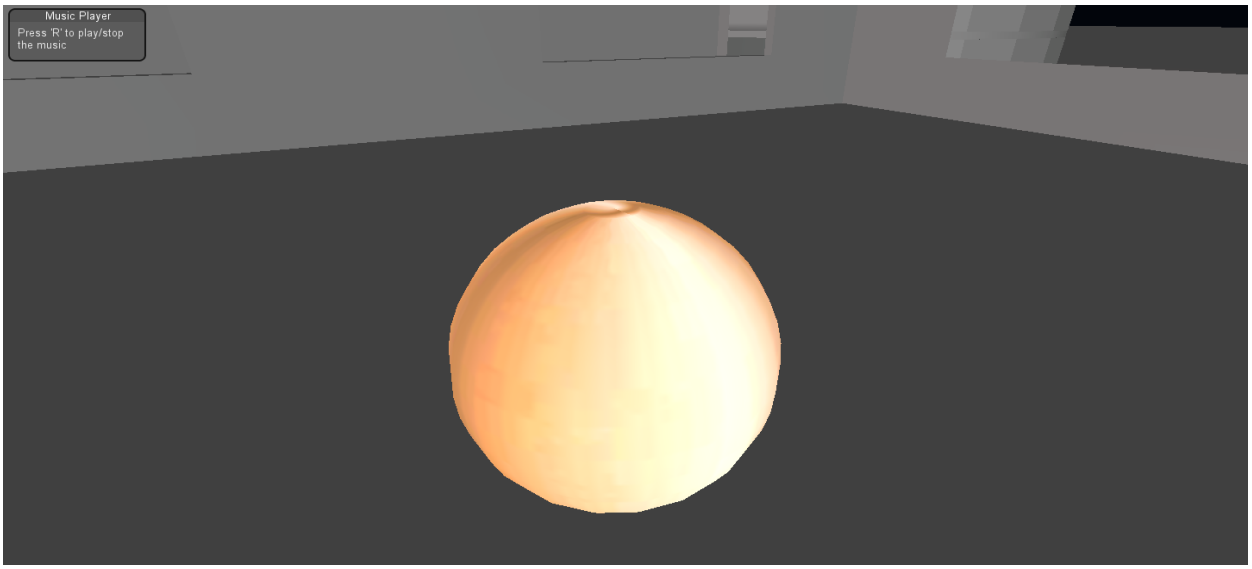

Figure 7: Music Box

7.2.2 Direction Arrows

The direction arrows help you wander in the environment as it shows the direction of the elevators, which teleport you to its destination once you get in them.

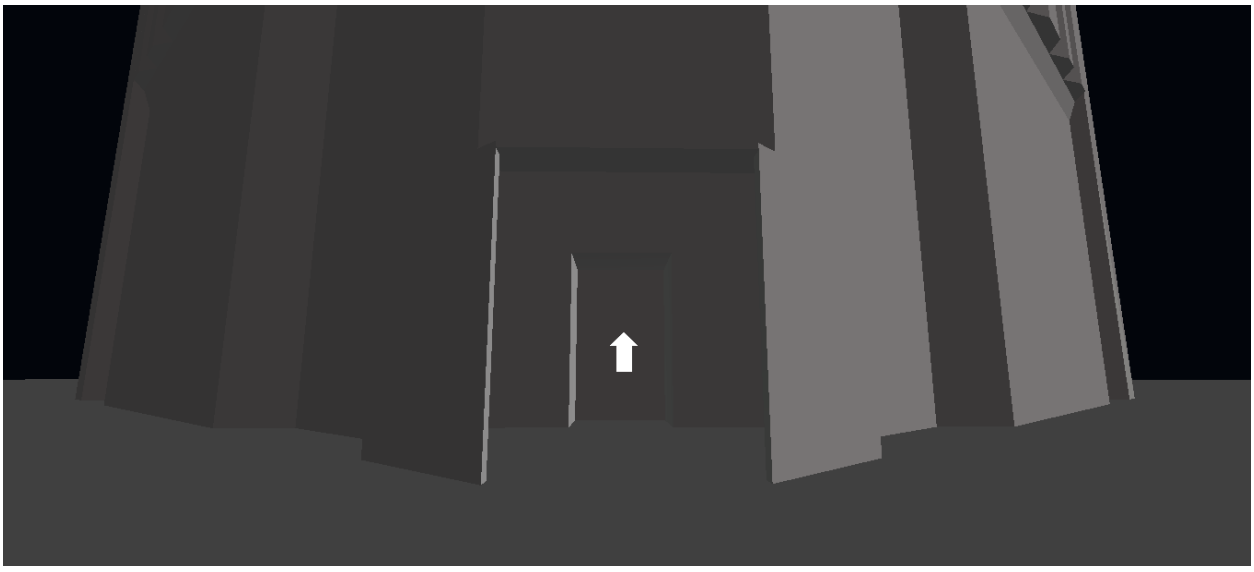

Figure 8: Direction Arrow

7.2.3 Projectile

The projectile that you fire by pressing left mouse-button enables you to interact with the sound effects as well as the music boxes. The projectile, seen in Figure 9, is small sun-like object with

variable colors. It illuminates the environment as it goes. Its movement is bound affected by gravity. By hitting the music boxes with the projectile you can activate or deactivate the box remotely. The interaction with the filters will be explained in a further section of the manual.

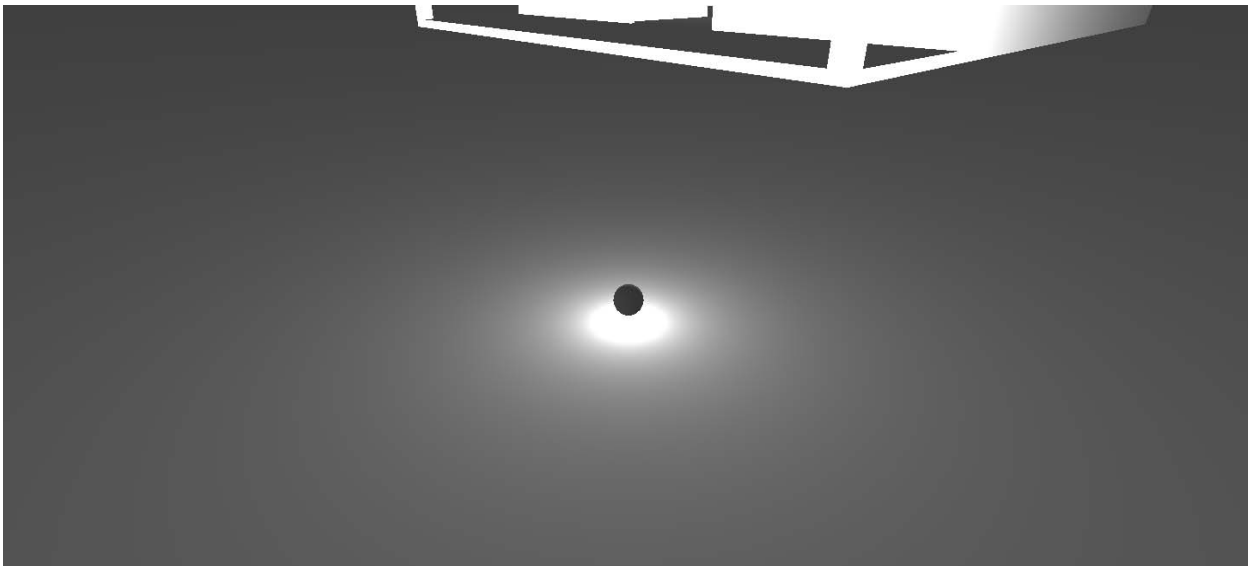

Figure 9: Projectile

7.3. Room Acoustics

The room acoustics exist in the rooms where music boxes exist. In order to experience their effect one must stay in that room, while listening.

7.4. Interaction with Filters

The controlling of the filters is done via the usage of the projectile. Each filter will be explained in detail below. Initially, when the game is loaded all the filters are disabled.

7.4.1. Low-Pass Filter

The low-pass filter is triggered by hitting the box enveloping the American foursquare as shown below in Figure 10. The low-pass filter has 4 modes and when hit the next mode is selected:

- 1st mode: Cut-off frequency at 22000 KHz
- 2nd mode: Cut-off frequency at 12000 KHz
- 3rd mode: Cut-off frequency at 7000 KHz
- 4th mode: Cut-off frequency at 2000 KHz

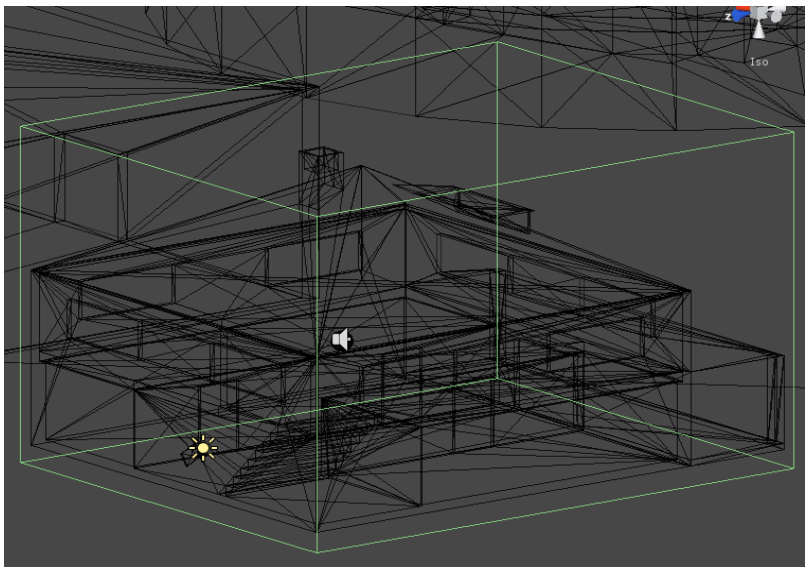

Figure 10: Low-Pass Filter Interaction Zones

7.4.2. High-Pass Filter

The high-pass filter has two zones one can hit in order to interact with. These zones are located around the Frankfurter Messeturm as shown in Figure 11. When hit the upper one increases the cut-off frequency by 500 Hz and the lower one decreases it by 500 Hz.

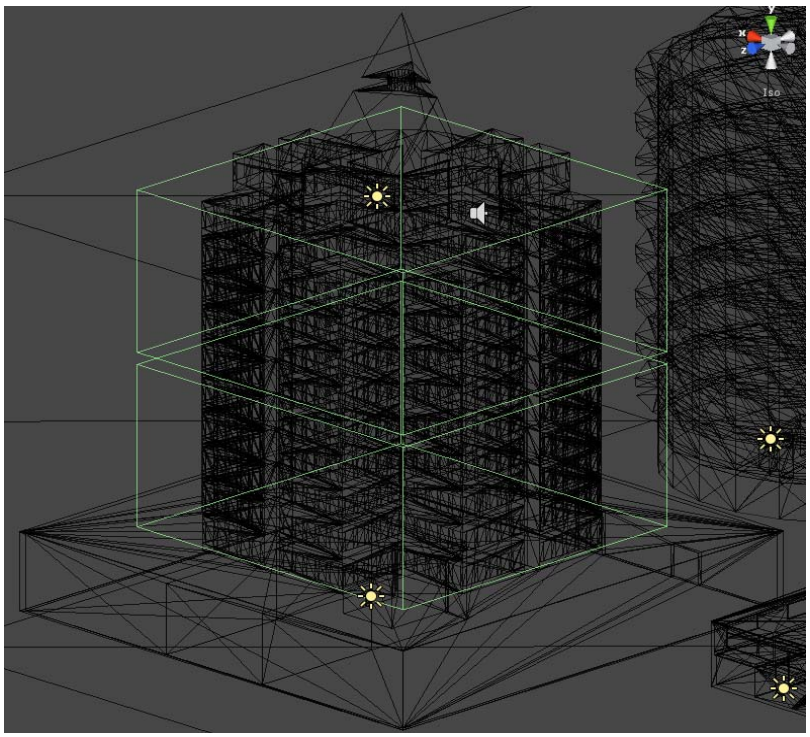

Figure 11: High-Pass Filter Interaction Zones

7.4.3. Echo Filter

As in real world, the echo filter exists in the Capital Records Tower. The echo filter has five control components. Figure 12 shows the location of the Zones for the interaction zones. Their functionality is as follows:

- The lowest box increases the amount of the signal echoed.
- The second lowest box decreases the amount of the signal echoed.
- The middle box increases the delay of the echoed signal.
- The fourth one decreases the delay of the echoed signal.
- The highest one have 4 modes and when hit the next mode is selected:
    - 1st mode: The echoed signal totally decays.
    - 2nd mode: 66.6% of the echoed signal decays.
    - 3rd mode: 33.3% of the echoed signal decays.
    - 4th mode: The echoed signal does not decay.

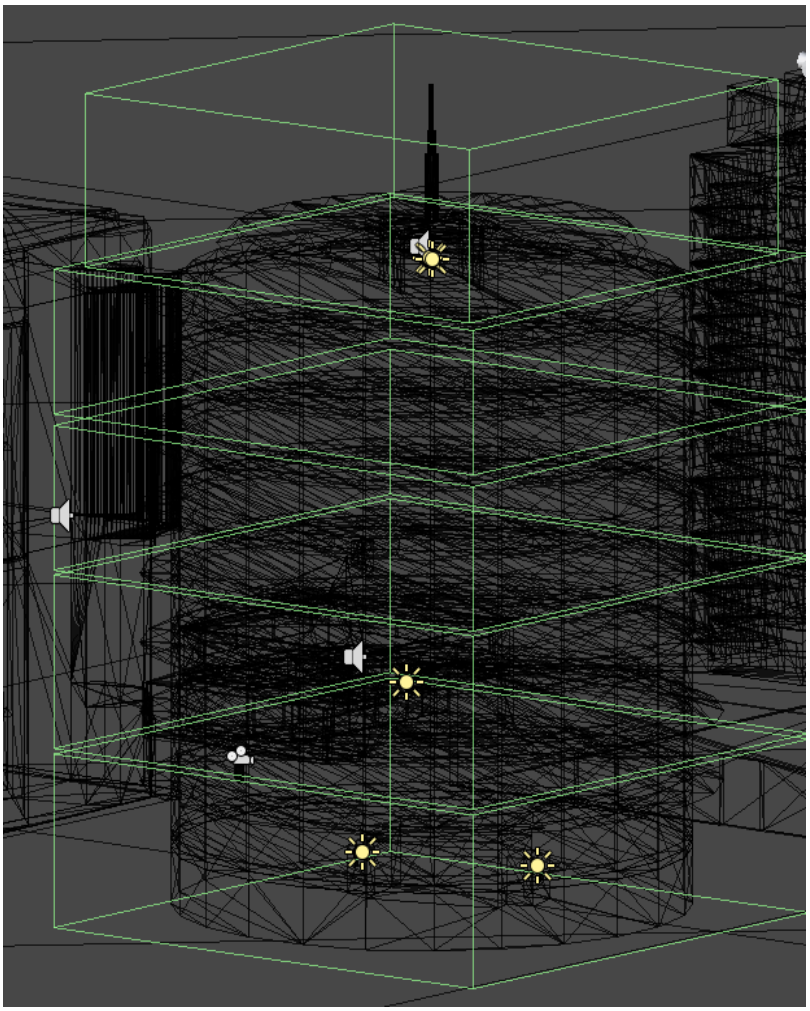

Figure 12: Echo Filter Interaction Zones

7.4.4. Distortion Filter

The distortion filter activation zones are located around the Robarts Library. The controls are similar to the high-pass filter. Figure 13 shows their exact locations. Hitting the upper one increases the amount of distortion by 10% while hitting the lower on decreases the distortion level by the same amount.

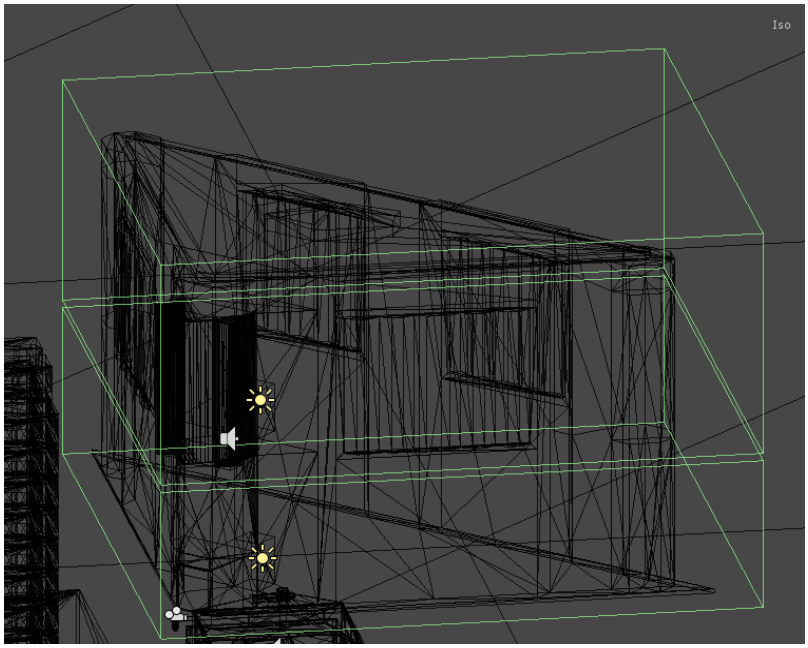

Figure 13: Distortion Filter Interaction Zones

7.4.5. Chorus Filter

The chorus filter interaction zones are located around the Frankfurter Messeturm. The filter has two interaction zone and both zones act in a mode base system like the low-pass filter. Figure 14 shows their exact locations. The upper one controls the amount of feedback of the chorus. Hitting the zone changes its mode to the next mode.

- 1st mode: 0% of the chorused signal is added to the output signal.
- 2nd mode: 33.3% of the chorused signal is added to the output signal.
- 3rd mode: 66.6% of the chorused signal is added to the output signal.
- 4th mode: 100% of the chorused signal is added to the output signal.

The lower one controls the amount of depth of the chorus. Hitting the zone changes its mode to the next mode.

- 1st mode: The modulation depth is 0%.
- 2nd mode: The modulation depth is 33.3%.
- 3rd mode: The modulation depth is 66.6%.
- 4th mode: The modulation depth is 100%.

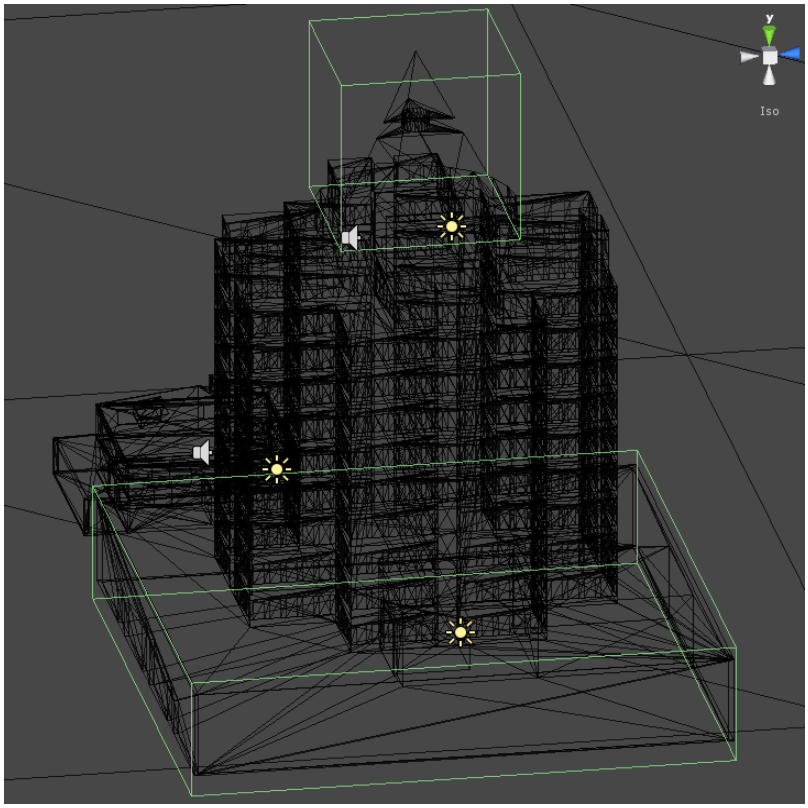

Figure 14: Chorus Interaction Zones

8. Final Notes

This manual can be found at: http://web.ics.purdue.edu/~rmungan/VEAE/manual.pdf

The game itself can be found at: http://web.ics.purdue.edu/~rmungan/VEAE/VEAE

Both the game and the documentation can be subjected to updates. Thus your documentation may not match the final version of the game at the link above, so do not forget to update your manual

All the songs belong to their copyrighted owners. The game VEAE: Virtual Experimental Audio Environment is not a commercial product but a course project.

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Enjoy your music!