

Requiem for Radio: Pulse Decay

Version 3.0

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1 Overview

This folder contains all the files for the *Requiem for Radio: Pulse Decay* performance. The performer plays the theremin on stage. Behind her, blueprint-like images of the Sackville radio towers are projected. The sounds of the corresponding radio tower is played back on speakers.

The theremin can play actual theremin sounds, but it is also used to select and crossfade between the 13 radio towers.

2 Folders and Files

2.1 ADC_theremin_20161029

This folder contains the Arduino sketch that is used to convert the theremin's CV outputs to digital signals. The CV outputs (pitch and volume) are connected to the analog pins 0 and 1 of the Arduino. Also, 10k Ω resistors are connected from the analog pins to the ground. They act as voltage dividers. There are also two diodes that prevent negative voltages from reaching the Arduino's analog pins.

The data is sent from the Arduino to the computer using the SLIP protocol. Each packet contains 4 bytes: two bytes for the pitch and two bytes for the volume. The Arduino's ADCs are 10 bits, so only two bits of the MSB are used.

byte	description	bit layout
1	Pitch MSB	000000xx
2	Pitch LSB	xxxxxxxx
3	Volume MSB	000000xx
4	Volume LSB	xxxxxxxx

On the box, the connector on the right is for pitch (CV) and the left one is for volume (CV).

2.2 bluePrints

This folder contains a Processing program that displays the towers' bluePrints. The images are in the **data** subfolder.

This program loads all the image files. It expects the files to be called **RfrPd_C_.jpg**, **RfrPd_D_.jpg**, and so on.¹,²

This program receives OSC messages from SuperCollider on port 60120.

OSC message	Arguments
/alphaChannels	13 floats between 0.0 and 1.0
/volume	One float between 0.0 and 1.0

The alpha channel of each of the 13 images is respectively affected by the 13 alphaChannel values. The volume affects the alpha channel of all images at once, essentially allowing the fade to black at any point.

The pitch antenna of the theremin controls which image (or tower) is visible.

2.3 sc-code

This folder contains all the SuperCollider code. The main file is **test.scd**. It should probably be renamed to **theremuino.scd**.

The **media** subfolder contains all the sound files required for the performance. There are two soundfiles for each tower: drone and glitch. Both files are played back together all the time.

The **prep** subfolder contains more SuperCollider code.

More details to come.

3 old and Requiem_PureData

Contains old PureData patches. Authors: Amanda Dawn Christie and Joël Lefort.

4 Processing code

The main things that may change are the resolution of the screen used, the framerate and the size of the image files.

¹The towers' letters are C, D, E, F, H, I, J, K, M, N, O, P and Q.

²There was a version of the program where the resolution of the file was included in the file name. Example: **RfrPd_C_1920x1536**.

Depending on the computer used, you may need to lower the framerate. Ideally, it should run at 30 fps, but it can run at 15.

The code has to be modified according to the size of the screen and the size of the images used. We had issues with images not being centered. It is because of line 44 in `void draw`.

To adapt to a specific image size, change the values on lines 13 and 14.

If the menu bar appears on the projector, move the mouse pointer on the screen and click. Clicking on another window makes the menu bar appear. Don't panic. Move the mouse pointer on the screen and click.

5 Runnig the code

5.1 Dependencies

The code depends on a few Quarks (which are extensions for SuperCollider). Installing Quarks requires `git`. Git is part of XCode, but XCode is a huge download. It is also possible to get `git` on git-scm.com. If `git` is installed with this link, you may need to run a command in the terminal to make it work. (At least, this is the case on Mac OS X 10.12.) Follow instructions in the git download's readme file.

Also, at least on MacOS X 10.12, you need to disable rootless system integrity protection as explained here: <http://ntfs-formac.com/how-to-disable-sip-rootless-system-integrity-protection>

In the end we downloaded XCode because the scm-git download did not work.

5.2 In SuperCollider

In SuperCollider, to install Quarks, you need to type this line of code:

```
Quarks.gui;
```

Execute it by pressing **Cmd+Enter**.

You need all these Quarks:

- `dewdroplib` (this one installs a bunch of other ddw Quarks)
- `wslib`
- `crucial-library`
- `XML`

1. Open the `sc-code/main.scd` in SuperCollider.

2. Boot the SuperCollider Server (**Cmd+B**). (It may boot automatically, but booting it twice causes no harm.)
3. Position the cursor on the first parenthesis and press **Cmd+Enter**.
4. To stop everything, recompile the SC Class Library by hitting **Cmd+Shift+L**.

The last line:

```
"../bluePrints/application.linux64/bluePrints".resolveRelative.unixCmd;
```

is supposed to run the Processing program. It never worked on Mac computers. You will need to comment out this line and run the Processing program manually.