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BELFAST**

**DOCTOR OF PHILOSOPHY**

**Designing space and place in auditory virtual environments**

**McKnight, Michael Alexander**

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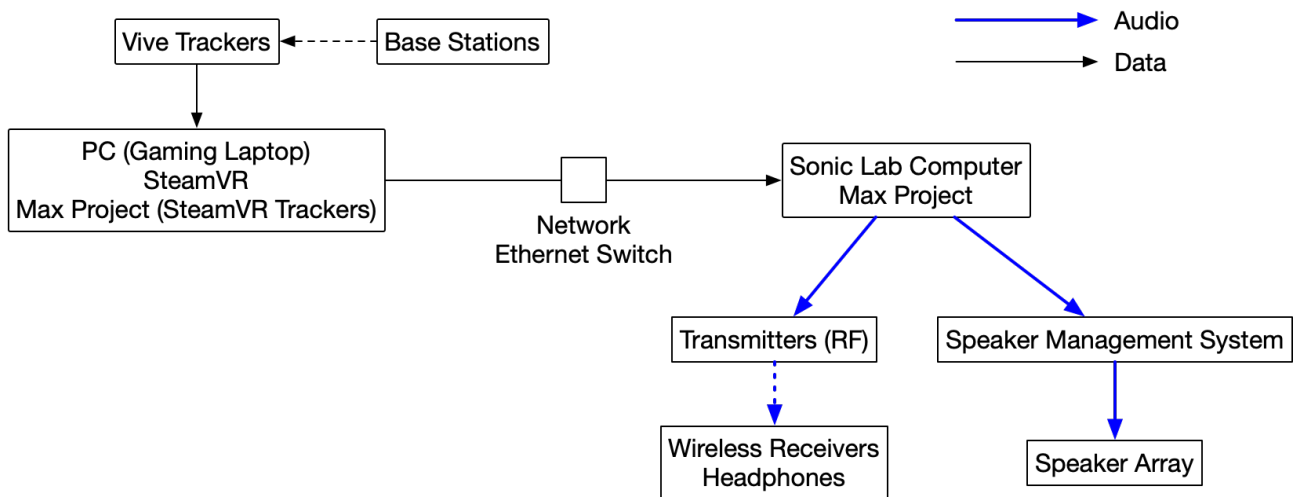
Note, it may not be possible in all instances to convert analogue formats to usable digital formats for some supplementary materials. We exercise best efforts on our behalf and, in such instances, encourage the individual to consult the physical thesis for further information.

## Tech Rider

### Equipment

- 10 x HTC Vive Trackers
- 10 x Sennheiser HD600 Headphones (or equivalent)
- 1 x HTC Vive Headset and Controller
- 4 x HTC Vive Base Station (Version 2)
- 10 x Sennheiser EW IEM G4 Stereo Transmitter and Receiver (or equivalent)
- 1 x Windows based PC with suitable spec to run Vive system with Max 8 installed
- 1 x Apple Mac computer with Max 8 installed
- Network switch and ethernet connection
- Periphonic Loudspeaker Array or similar
- Audio Interface with enough output channels to feed speakers and transmitters (Sonic Lab requires 60 channels of audio and uses an aggregate device of Dante and Avid interfaces).

### System Overview



### Output Audio Channels

Ch 1-40 - Speakers using Dante interface

Ch 65-84 - Headphones/Transmitters using Avid interface

### Frequency plan for transmitters

(UK - Ch38)

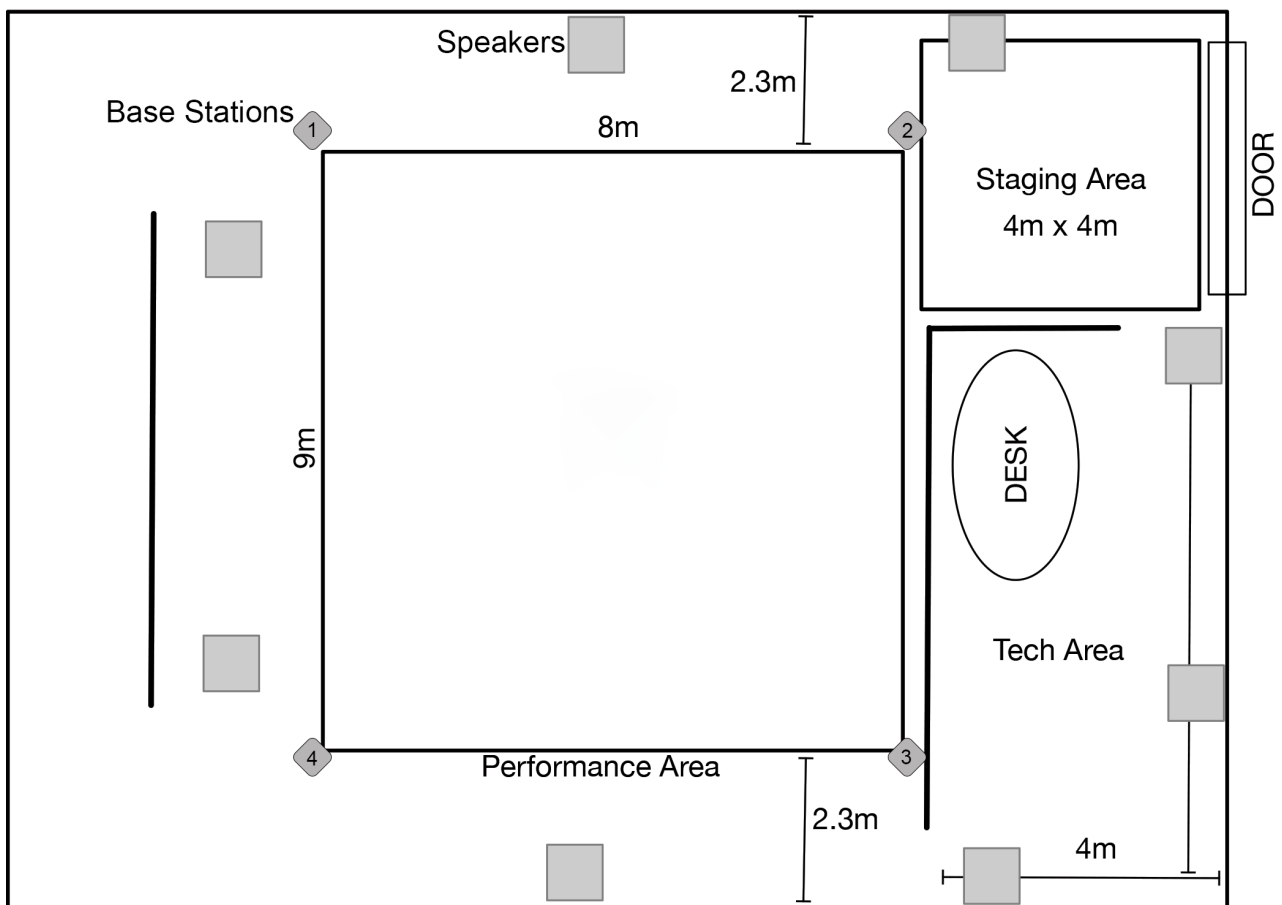
The suggested frequencies, based on Sennheiser transmitters, are free from intermodulation issues.

1. 606.000
2. 606.300
3. 606.750
4. 607.350
5. 608.850
6. 609.750
7. 611.975
8. 613.650
9. 617.800
10. 619.000

## Sonic Lab Loudspeaker Coordinates

Number	Description	X Left-Right	Y Front-Back	Z Height
1	Genelec 1	-2.66	6.43	1.18
2	Genelec 2	2.66	6.43	1.18
3	Genelec 3	-5.59	2.66	1.18
4	Genelec 4	5.59	2.66	1.18
5	Genelec 5	-5.39	-2.66	1.18
6	Genelec 6	5.39	-2.66	1.18
7	Genelec 7	-3.27	-5.59	1.18
8	Genelec 8	3.27	-5.59	1.18
9	Meyer Mid 1	-5.15	6.4	3.79
10	Meyer Mid 2	5.15	6.4	3.79
11	Meyer Mid 3	-5.15	3.2	3.79
12	Meyer Mid 4	5.15	3.2	3.79
13	Meyer Mid 5	-5.15	0	3.79
14	Meyer Mid 6	5.15	0	3.79
15	Meyer Mid 7	-5.15	-3.2	3.79
16	Meyer Mid 8	5.15	-3.2	3.79
17	Meyer Mid Rear 9	-3.73	-5.2	3.79
18	Meyer Mid Rear 10	3.47	-5.2	3.79
19	Meyer Mid Rear 11	-1.2	-5.2	3.79
20	Meyer Mid Rear 12	1.07	-5.2	3.79
21	Meyer Mid Screen L	-3.2	9.1	3.79
22	Meyer Mid Screen R	3.2	9.1	3.79
23	Meyer Mid Screen C	0	9.1	3.79
24	Meyer High 1	-3.2	6.4	7
25	Meyer High 2	3.2	6.4	7
26	Meyer High 3	-3.2	3.2	7
27	Meyer High 4	3.2	3.2	7
28	Meyer High 5	-3.2	0	7
29	Meyer High 6	3.2	0	7
30	Meyer High 7	-3.2	-3.2	7
31	Meyer High 8	3.2	-3.2	7
32	Meyer Low 1	-1.66	4	-2.05
33	Meyer Low 2	1.66	4	-2.05
34	Meyer Low 3	-4	1.64	-2.05
35	Meyer Low 4	4	1.64	-2.05
36	Meyer Low 5	-4	-1.69	-2.05
37	Meyer Low 6	4	-1.69	-2.05
38	Meyer Low 7	-1.66	-4	-2.05
39	Meyer Low 8	1.66	-4	-2.05

## Sonic Lab Overview



## Setup Instructions

Position base stations around the performance area. Version 2 is required to facilitate a maximum area of 10m<sup>2</sup>.

Attach trackers to headphone bands.

Trackers connect via bluetooth and have an associated usb dongle that must be connected to the computer. A usb hub maybe required if insufficient number of ports.

Pair trackers in Steam VR and disable labels for each tracker in settings, under 'manage controllers'.

Note tracker ID numbers and add to max patch (SteamVR Trackers).

A supplied list of tracker IDs for the Sonic Lab is embedded in patch, as well as in a text file in the portfolio.

Match each tracker to the appropriate IEM receiver.

Perform a room setup in SteamVR.

Enter the target IP address into the SteamVR Trackers patch i.e. for MacOS computer that is running max patch of the work. This IP address is displayed on the main patcher of the piece or immersive audio framework.

Select a port and ensure they are set to the same number, for example 4000.

Enter room dimensions.

Set desired parameters for audio/spatialisation/decoder in patch on Sonic Lab computer.

Set output device and turn on audio within Max.

Play/Stop and reset available on main patcher.