

imitating the dog:

Music and Sound Design – Technical Plan

How the sound system works, with James Hamilton and Rory Howson

introduction

This document describes the technical basis of the sound system for a typical imitating the dog production: how composed material travels from the studio to the theatre, how cues are triggered in performance, and how the speakers are set up. It's written for design pathway students and teachers who want a clear mental model of how the system works, rather than a full technical specification. The words are James Hamilton's and Rory Howson's own, edited from written interviews into continuous prose — James on how the music is made and delivered, Rory on how the system is routed, toured and kept running.

› Read this alongside the companion document: Music and Sound Design: James Hamilton & Rory Howson interview (Section 3).

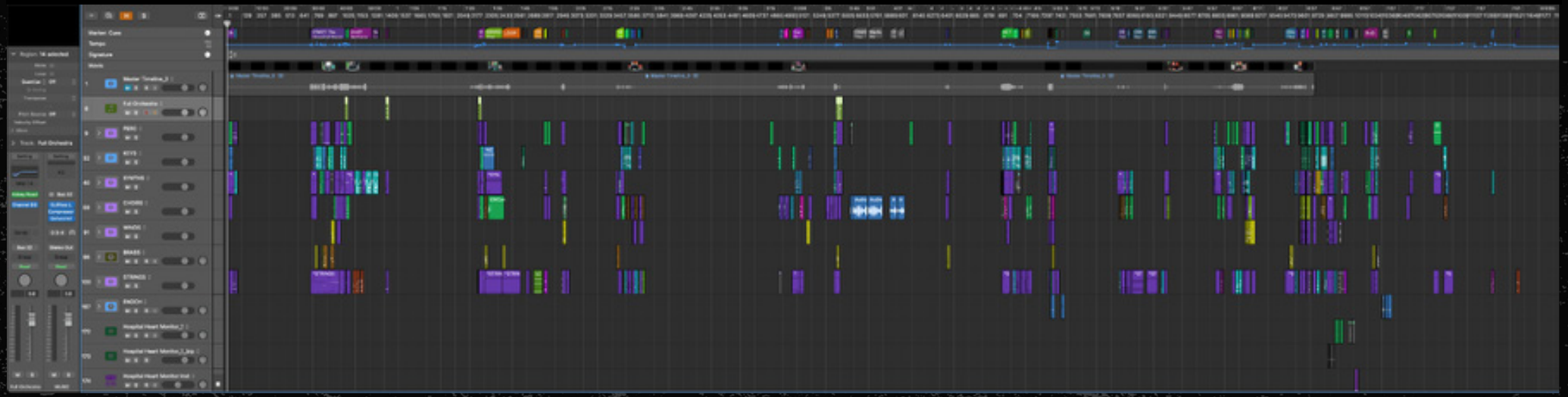
the system

From Logic to QLab

For a stage show, the workflow is to create individual music cues within a Logic master timeline project — every music cue from *War of the Worlds*, for example, is contained within one Logic project (see image below). Having everything in one file speeds up content creation and saves time opening and closing multiple projects. Once each cue is finished, it's bounced down to a .wav file, loaded into QLab and programmed into the show.



War of the Worlds (2026)



Every music cue for *War of the Worlds* (2026), held in a single Logic master project

Rory Howson, who routes, tours and operates the sound system, picks up the signal chain from there:

In QLab, the files are routed through an audio interface and then out to the sound desk. Typically, the interface will be routed something like Left, Right, Centre, Sub, which allows full control over where each file is sent, at what volume, and how it all balances in the room. This routing is, for the most part, consistent across all shows, although on some productions I have added additional on-stage speakers or auditorium surrounds to create localised sound or movement, which also need to be accommodated within the interface routing.

The audio interface feeds directly into the sound desk, where it goes through further routing and balancing. The input to the desk follows on from the output of the interface, but the desk allows additional venue-specific routing and control. For instance, audio files routed to Left and Right in QLab and the interface can then also be routed to on-stage monitors, delay speakers or circle fills.

All of this is pre-planned and considered against each venue's in-house speaker system, making the touring from venue to venue as seamless as possible. I build a document listing the specifics of each venue, so I can plan out the system configuration in the desk prior to touring. The configuration is programmed so that connecting to the venue system can be done locally at the desk or on stage via a stage box; it all depends on the specifics of the venue. These steps in the routing really allow us to get the most out of the composition, the foley design and the venue system. Filling the space and giving each audience member the same and best experience is integral. All the balancing and fine-tuning happens in the set-up at each venue, so it's set for the audience; any adjustment from that point is usually just volume, and how much is absorbed by the audience.

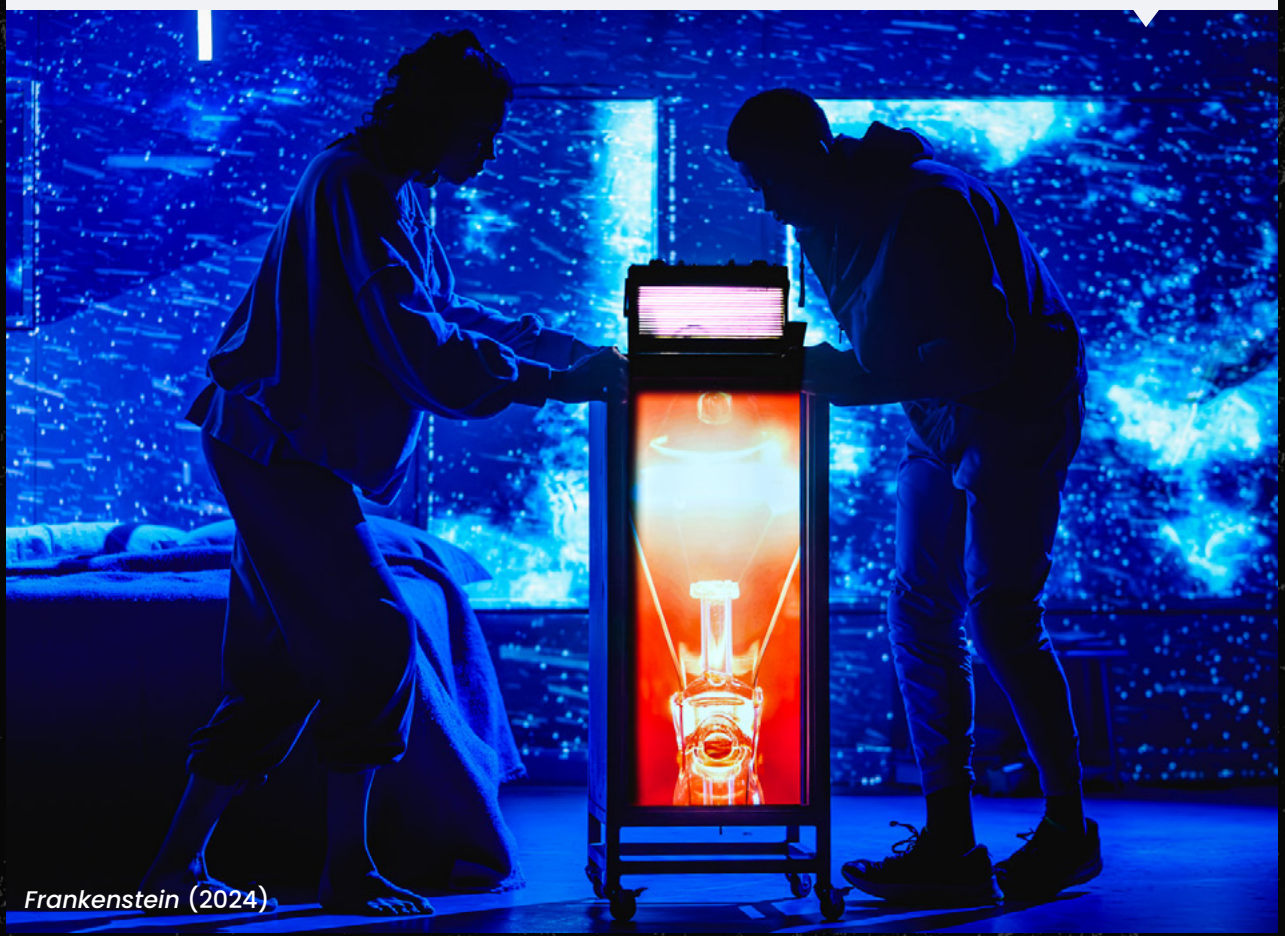
Triggering the show

All sound is triggered from a QLab machine, operated by a show operator. The machine also sends triggers to video and lights. Usually we're all moving together, so a single button press can trigger a change in all three departments at the same time. For most parts of the show, this is triggered cue by cue, but in some cases — like in *War of the Worlds* — there might be large timecoded set pieces, where sound, lights and video are automatically triggered for a short period of time. This could be for a section of pre-recorded video.

Sometimes we have actors doing the voices for a pre-recorded piece of video, as in *Night of the Living Dead*™ – *Remix*; in this case we feed the actors the words through an earpiece, in order to stay in sync with the video. The full explanation of how this shared signal chain works across video, sound and lighting, with a diagram, is set out in Video Design and Projection Mapping – Technical Plan (Section 3).

Speakers: front-of-house and on stage

We're largely dictated by the in-house system set-up for each venue. This can vary greatly, but usually you'll have at least left, right, centre and sub. Dialogue is sent to all speakers the majority of the time, unless you're trying to achieve a specific spatial effect. In general, you don't want to put any music or foley into the centre speaker, that should be for dialogue only. In addition to this, we may place some small speakers on stage for effect. In *Frankenstein* we had an on-stage radio as a prop, and placed a small speaker inside it to give the impression that sound was coming from the radio on stage. Occasionally, we'll have side fills so actors can hear what's coming out of the front-of-house speakers. This can help them with timings for certain moments highlighted in the soundtrack or foley.



Frankenstein (2024)

practical guidance for students

Getting started

If you have a Mac, GarageBand is a free and very capable DAW; for PC users, Cakewalk Next is a great free option. Both come with their own sounds, but there's a wealth of free sample dinstruments available from places like The Crow Hill Company, Native Instruments, Spitfire Audio, Pianobook, Spitfire LABS and Westwood Instruments. I would encourage students to experiment with creating their own sample instruments and sounds. You can start very simply, using your phone to record things and the software above to manipulate them. All the sound effects you'll ever need are available for free on freesound.org. QLab with a basic audio licence is free, so you can get started programming and getting to grips with building a cue stack very quickly.

Common problems and fixes

Most technical problems involve a missing or faulty cable, dead batteries, something not turned on or muted, and user error. Logically working through the system will eventually lead you to the problem.

Rory adds, from the touring side:

Most issues can be limited by good planning and labelling. Making clear documentation around system routing and configurations — labelling cables, the stage box, QLab and so on — means there's a point of reference for all staff at each venue.

Keeping clean and tidy cable runs is also very important, as this can help you locate a faulty cable or issue very quickly. Clear access to patch bays, stage boxes and similar equipment should always be maintained so that any faults or technical issues can be identified and resolved quickly.

All our shows use radio mics and, quite regularly, in-ear monitors (IEMs) as well. These are all wireless and use RF (radio frequency). Checking what RF is being used in the venue is good practice, and means frequencies can be changed to avoid clashing.

If there are matching or clashing frequencies, you can get interference, which is not good and can mean microphones drop out or produce unwanted noises. This also applies to IEMs: you really don't want that in a performer's ear.
Our wireless equipment is Sennheiser, so I use Wireless Systems Manager (WSM) to monitor all the mics and IEMs throughout the show. It gives a visual of how things are functioning and behaving through the show. I'd always recommend having the relevant software for doing this, or having a sound no. 2 on stage to monitor these things.

glossary

DAW / Logic Pro — A Digital Audio Workstation; the software used to record, arrange and mix music. Logic Pro is the DAW James uses; GarageBand and Cakewalk Next are free alternatives.
Bounce — Exporting a finished piece of music from the DAW as a single audio file, such as a .wav.
QLab — Software widely used in theatre to build and play back a show's cues; usually sound, and in ITD's system, video and lighting cues as well.
Cue stack — The ordered list of every cue in the show, played back one button press at a time.
Timecode — A running clock signal that keeps sound, video and lighting automatically in sync during set-piece sequences.
IEM (in-ear monitoring) — An earpiece feed to performers, used for timing, staying in sync with pre-recorded material, or hearing a click or voice feed.
Front-of-house (FOH) — The main speaker system facing the audience; typically left, right, centre and sub (the low-frequency speaker).
Side fills — Speakers at the sides of the stage pointing at the performers, so they can hear what the audience hears.
Audio interface — The hardware box that converts the computer's audio into multiple physical outputs, so that QLab can send different sounds to different speakers.
Stage box — A connection panel on or near the stage that carries many audio lines to and from the sound desk down a single multicore cable.

Delay speakers / circle fills — Additional speakers covering seats far from the main system, such as under balconies or in the circle, are time-aligned so the sound arrives together.

RF (radio frequency) — The wireless spectrum used by radio mics and IEMs. Clashing frequencies cause interference and drop-outs, so the venue's RF in use is checked at each get-in.

» Try it yourself: build and operate a simple cue stack for the Live Cinema Workshop (Exercise 2) in Adaptation and imitating the dog: Practical Exercises (Section 4).

Published 2026 as part of imitating the dog's learning resources (Section 3: How We Make Work).

Photography of *Frankenstein*: Ed Waring.