

# Atmos Audio Capture Guidelines

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## Introduction

This document is intended to provide an overview on audio capture with object based mixing in mind as the target for recorded material. Luckily this approach does not deviate much from standard audio capture protocols. This document therefore, is intended to be an addendum to an already robust understanding of live, as well as production audio recording techniques. It is also worth noting that this document will be addressing issues primarily, though not exclusively, associated with music and event related captures.

## What is Atmos?

Atmos is Dolby Laboratories object based audio creation, delivery, and playback solution. It encompasses a delivery format that does not require knowledge of the target speaker configuration to allow for the creation of compelling immersive audio. Regardless of whether the target is stereo, 5.1, 7.1, or 63.1 – Atmos allows the content creator to mix with nothing more than a desire to place an audio source (object) in a particular room location. The Atmos playback tools will then, during playback, distribute audio signals to the available speakers – all the while calculating the levels required to best recreate the location originally chosen by the audio mixer. One obvious benefit being that production entities need only mix the audio once. No longer is it necessary to do separate 5.1 and 7.1, as an example.

Atmos playback employs height speakers as well, allowing for massive flexibility in object placement. Additionally, Atmos objects will be represented with whatever granularity the speaker configuration allows for; in other words, each speaker is individually addressable by the playback software and therefore object placement can have an extremely high degree of localization.<sup>1</sup> This is especially important in the case of objects that move.

## Audio Capture Approach

One of the main issues that becomes apparent when playing back Atmos content in a large speaker configuration (i.e. commercial cinema) is that single source ambient content, when distributed over large areas, can tend to sound muddled and lose its spatial characteristics. It is preferable therefore, especially in cases of ambience capture, to have as many de-correlated audio objects as possible to spread around the three dimensional audio environment.

As Atmos playback involves side, rear, and height speaker locations – microphone placement will optimally reflect like placements. Regardless, a good rule of thumb is to capture as many ambience microphones as possible. As a point of reference – microphone setups with as few as 10, or as many as 28 microphones have been used with great success.

## Microphone Placement

The majority of listening environments will be analogous to a theatrical presentation in respect to listener position and wall locations. (i.e. The listener will be in the middle of the room, looking at a screen in front of them, with boundaries to their sides, rear, and overhead.) It is therefore considered optimum to have microphone locations that allow for parity between venue microphone location and speaker placement within the listening environment. There are diagrams in appendix C that illustrate practical applications of this approach.

In a live concert environment, it is also of great benefit to locate some microphones on the stage pointed at the audience. Often there will be crowd reactions that are important to the recreation of the event. This is especially true when there are visual components to the capture and crowd interactions are visibly taking place.

It is also worth noting that, where possible, care should be given to mitigate the impact of the P.A. signal leaking into the ambience microphones. While this is often unavoidable, it is none the less an issue that should always play some role in placement decisions.

## Microphone Selection

Often microphone selection is dictated more by what is available than what is desired.

A combination of microphones is usually the best solution – often encompassing several omni-directional high-resolution microphones, as well as several cardioid/directional microphones.

For main side and height capture our recommendation is to use very high quality omni-directional microphones

For augmented side and height capture our recommendation is to use high quality cardioid microphones.

For audience reaction and FOH locations our recommendation is to use high quality tight cardioid and shotgun type microphones.

## Practical Issues

Sometimes choosing the optimum microphones and putting them in the optimum location is just not feasible. There are many things that can impact desired plans, these include but are not limited to:

- Air conditioning register proximity
- Lack of cable run access
- Visual requirements of the video capture team
- Venue access issues
- Union issues

It is important to realize in these cases that most issues can, when really necessary, be overcome in the mixing environment - whether through equalization matching and/or delay compensation. It is with that in mind that one must always remember to weigh the optimum solutions with the practical impact of implementing them. In the end it is more important that the show gets recorded at all, than it get recorded with the perfect set up. In practice microphone quantity is more important than ideal placement.

## Recording Hardware and Settings

In general, high-quality recording equipment should be used whenever possible, and used to its fullest extent. These practices should include but are not limited to:

- Microphone preamplifiers should be set with ample operating headroom
- Recording hardware set at the highest sample rate and bit depth that is practically possible
  - Minimum resolution is 48 kHz 24 bit.
  - Standard practice should be to aspire to 192 kHz 32 bit captures
- Minimal or no usage of dynamics processing on the recorded signal
- Time base & LTC synchronization with video capture system when applicable

## Documentation Requirements

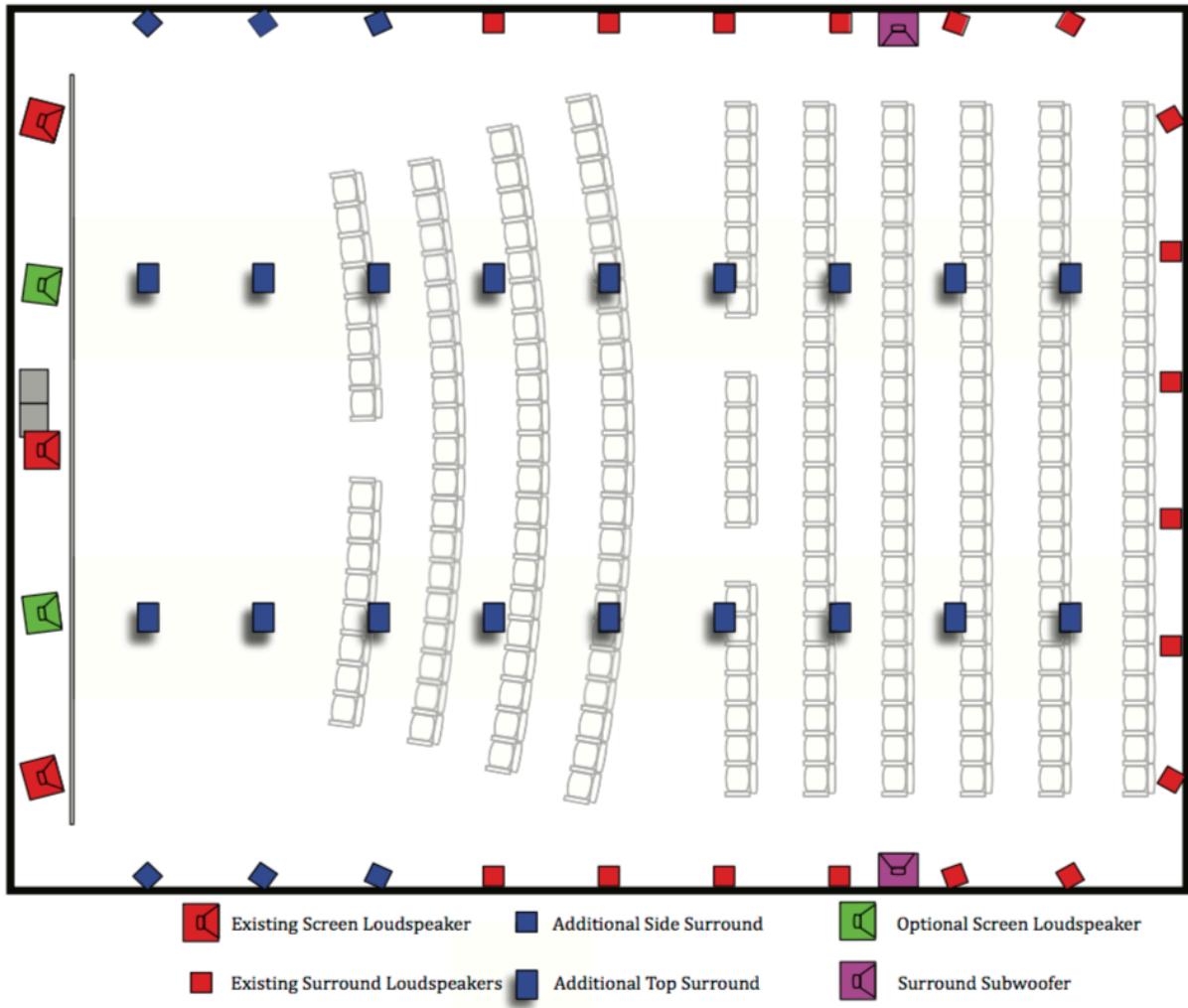
It cannot be overstated how important it is for there to be robust and thorough documentation of all aspects of captures destined for an Atmos mix. These requirements should include but not be limited to:

- Microphone locations - X, Y, and Z - should be documented and noted on a venue blue print
- Recording location
- Time Base information
- Artist and performers
- Titles performed and related timings within delivered files
- Date of performance
- Location of performance
- Audio crew listing complete with job description and contact information
- Audio track listing with appropriate nomenclature to link audio track to microphone placement documentation

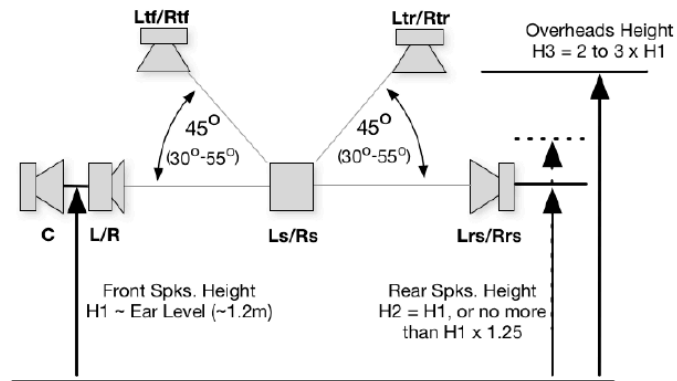
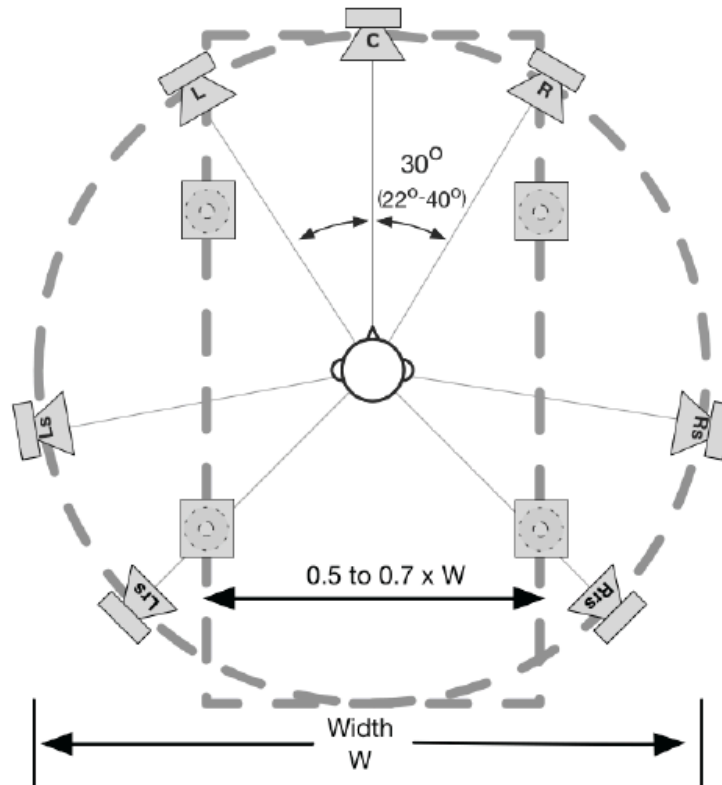
All documentation should be included in both hard and soft form and adhere to the DDEX Metadata standards where applicable. More information on best music capture documentation practices can be found here:

<https://www.grammy.org/recording-academy/producers-and-engineers/guidelines>

# Appendix A: Sample Theatrical Atmos Speaker Configurations<sup>2</sup>

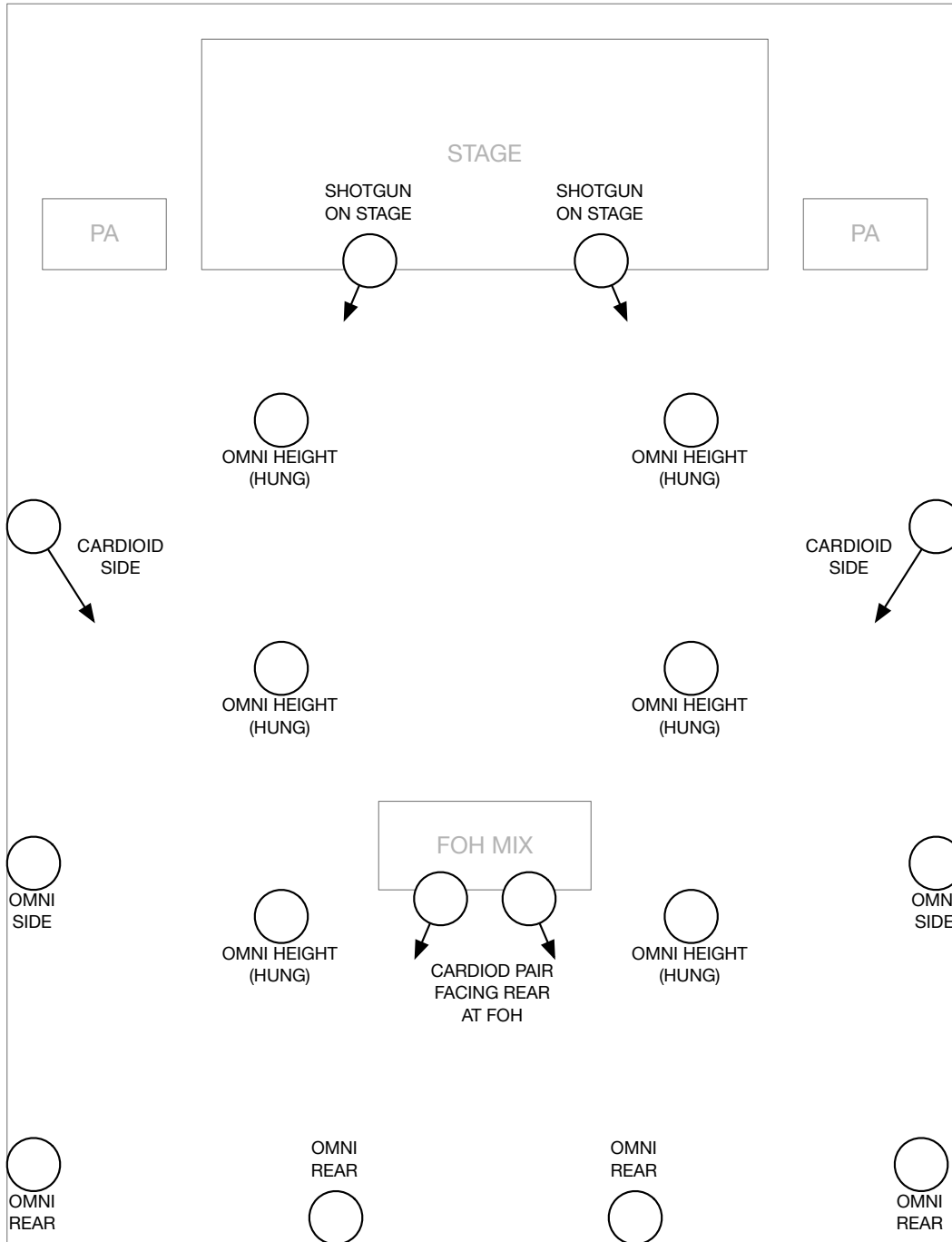


## Appendix B: Sample Home Atmos Speaker Configurations

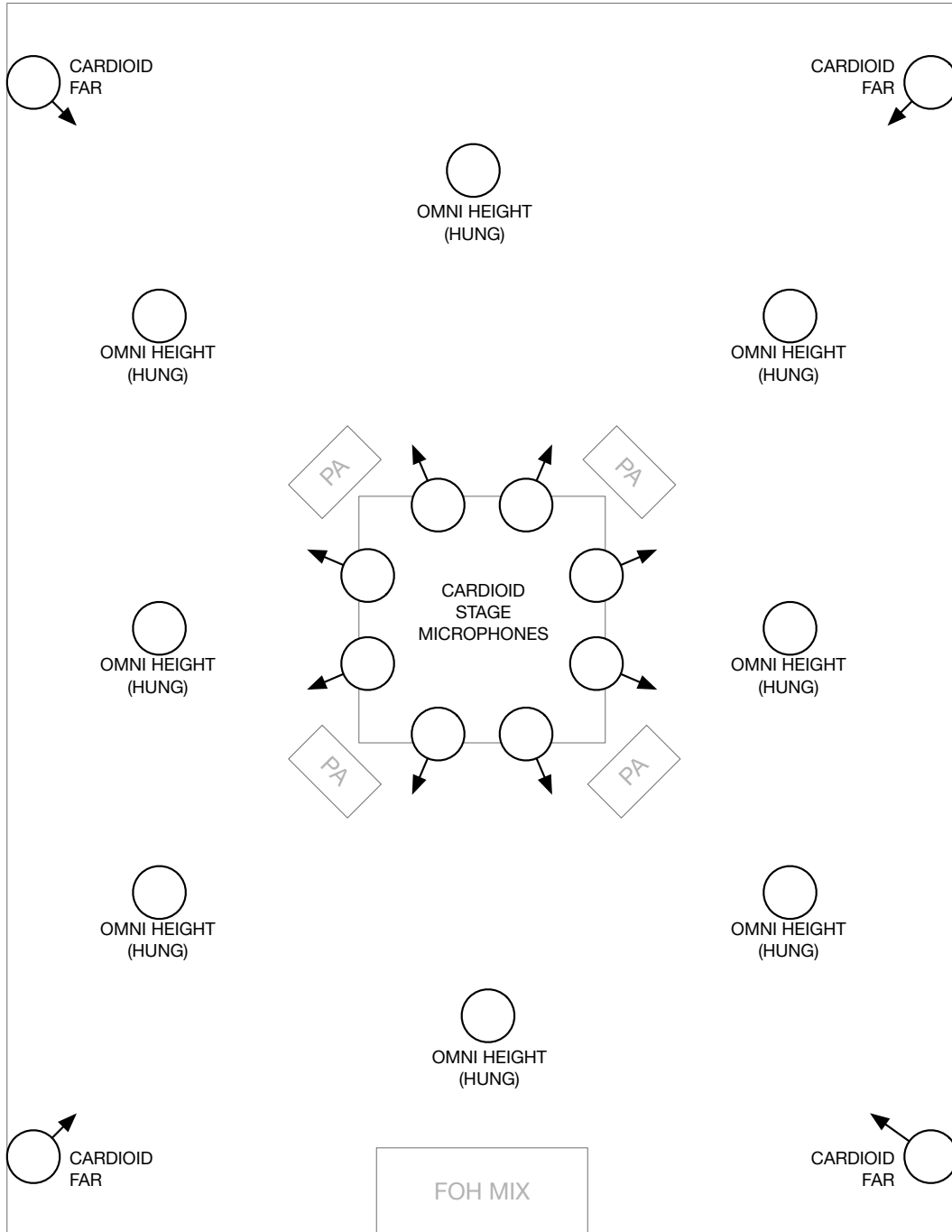


# Appendix C: Sample Microphone Locations Diagrams

Microphone Placement Example #1 - Performance Hall

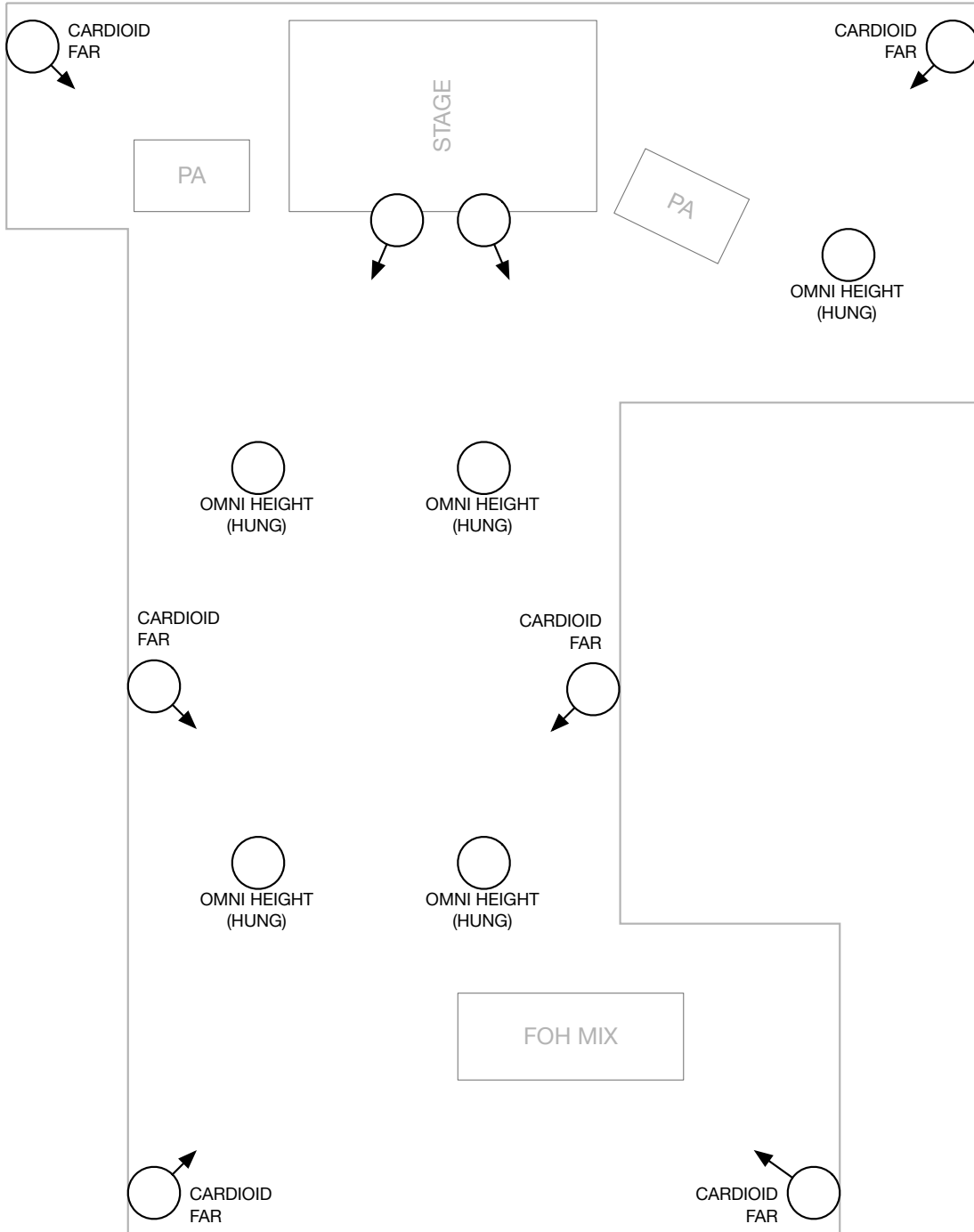


Microphone Placement Example #2 - Performance In The Round



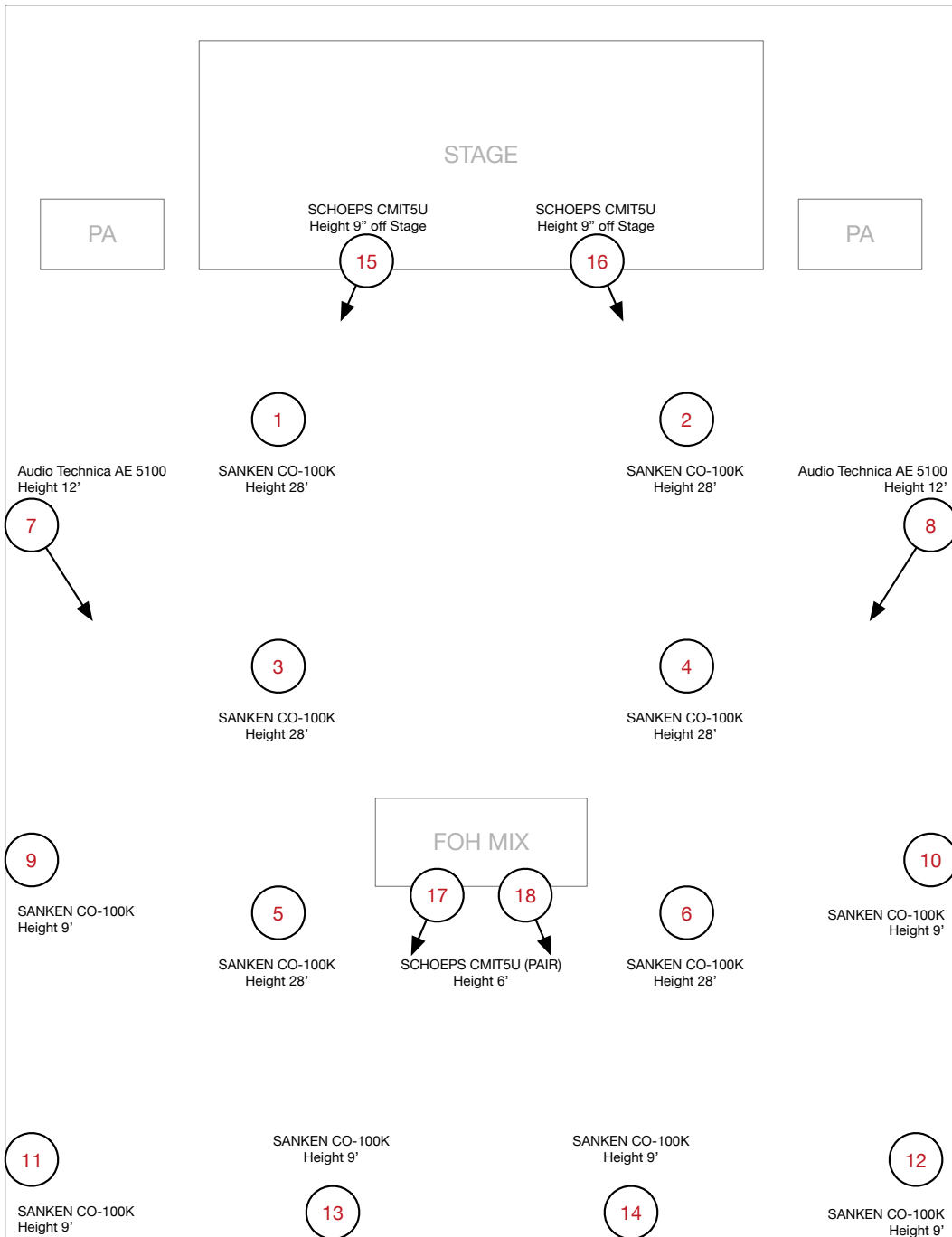


Microphone Placement Example #3 - Non Uniform Performance Space



# Appendix D: Sample Microphone Location Documentation

Microphone Documentation Example



## Appendix E: References

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<sup>1</sup> <http://www.dolby.com/us/en/professional/cinema/products/dolby-atmos-next-generation-audio-for-cinema-white-paper.pdf>

<sup>2</sup> <http://www.dolby.com/us/en/technologies/dolby-atmos/dolby-atmos-specifications.pdf>