



## WHICH MICROPHONE SHOULD I USE FOR A HEARING AUGMENTATION SYSTEM?

### Examples of a hearing augmentation system

Hearing augmentation can be any one of the following:

- Hearing Loop System
- Digital/FM System
- Infrared System

These systems typically connect to the output of an existing PA, sound system, background music or sound source. In addition, wireless microphone receivers, TVs or music sources can be connected directly to the hearing augmentation system.

### Common Problems

#### 1. Using the wrong microphone.

It is imperative to use the right microphone. The various types of microphones are listed below.

#### 2. Using the microphone incorrectly

The most common mistake is to install a ceiling microphone above the speaker. Another mistake is to place the microphone in the middle of the table behind which the speaker stands.

Neither of these allow the microphone to pick up the sound as needed.

#### 3. Reverberation

When a PA is used, the sound from the speakers bounces off all the surfaces in the room, resulting in blurred sound for hearing-impaired listeners. This is called reverberation. The objective of a hearing augmentation system is to allow the hearing-impaired to hear as if they were one metre from the sound source. This is achieved by removing both background noise and reverberation, giving the clearest possible sound to the ears, whether by hearing aids or cochlear implants.

The wrong microphone, or the right microphone used incorrectly, can defeat the purpose of a hearing augmentation system, and renders the system useless. It can also leave the venue operator open to an indefensible Disability Discrimination Act complaint.

## Types of Microphones

The different types of microphones, together with distances for use with a hearing augmentation system are referenced in AS 1428.5 – 2010

Handheld	Less than 100 mm
Gooseneck directional	300 mm to 600 mm
Boundary unidirectional microphone	150 mm to 500 mm
Shotgun microphone	Up to 8 metres from stage
Lapel microphone	Less than 200 mm



*Please note that the maximum distances stated above are absolute maximums.*

## Use of Shotgun microphones

For hearing augmentation purposes, shotgun microphones are only to be used for live performance spaces. Shotgun microphones are designed for recording from a distance, and the directionality applies at higher frequencies much more than lower frequencies. Therefore, for hearing augmentation systems, a much more directional shotgun microphone is required than that used for recording or for back-of-house in performance spaces.

## Use of Lapel Microphones

These must be worn near the neck (hence the term “lapel”) and pointed at the mouth (they are usually directional microphones, so pointing them at the mouth is crucial.) Sometimes they are wrongly clipped on the speaker’s tie, outside the maximum distance from the mouth, and consequently produce poor sound quality.

## Testing

It is important that when testing the system that all microphones are used in the fashion and at the levels that they will be used in real life. It is important to test both the clarity and for the levels which will be used.

## References

National Construction Codes (previously called Building Code of Australia - BCA); and Disability (Access to Premises - Buildings) Standards 2010

### **DP9 – The Performance Requirement of DP9 states:**

An Inbuilt communication system for entry, information, entertainment, or for the provision of a service, must be suitable for occupants who are deaf or hearing impaired.

**D3.7** states the “Deemed To Satisfy” provision for **DP9**.

**D3.6** states the signage requirements.

### **AS 1428.5 – 2010 – Communication for people who are deaf or hearing impaired**

This standard may be downloaded [here](#).

**NCC** may be downloaded at no charge from [ncc.abcb.gov.au](http://ncc.abcb.gov.au)

## FURTHER INFORMATION

If you have any questions, email Andrew Stewart: Managing Director of Hearing Connections at [andrew@hearconnect.com.au](mailto:andrew@hearconnect.com.au)

Other articles are available [here](#)  
Sign up to receive our newsletter [here](#)

### About the Author

Andrew Stewart is qualified in electronics and has been leading research into hearing augmentation systems for over 30 years – including designing, installing, testing and commissioning of Hearing Augmentation Systems. He and his team have conducted their own research of comparison methodologies of installing hearing loop systems and designed and constructed test equipment. He's been involved in installations at Sydney Opera House, First Class Qantas Club Singapore, art galleries, museums, theatres and many others.

Andrew was a key leader in the development of AS 1428.5 - 2010, the authoritative document on Hearing Augmentation in Australia. He is also a life member of Deafness Forum of Australia (the peak body for hearing impaired people in Australia) and continues to represent them, as he has on many committees for over 20 years. Andrew has been hearing impaired all his life, with a progressive loss, and now wears two cochlear implants. He has 9 other family members who wear hearing aids and/or cochlear implants.

### Why choose Hearing Connections

**Hearing Connections is built on experience of Andrew Stewart, who:**

- Has been **wearing hearing aids** since age 7, and now wears two cochlear implants.
- Knows both sides of the story – the **lived experience**, and the **electronics qualifications**.
- Has been **specialising** in Hearing Augmentation Systems for over 33 years.
- Was **instrumental** in the writing of the definitive Australian Standard **AS 1428.5**.
- Has conducted **research and development** of Hearing Augmentation systems for improved outcomes.
- Has over **33 years of design, installation and commissioning** of Hearing Augmentation systems (loop systems, FM systems, sound field systems and public address systems) for a range of public access buildings, from small halls to significant buildings and venues, including Sydney Opera House and airports.
- **Lectures** in Hearing Augmentation for building professionals.
- Provides **training** in Hearing Augmentation for Access Consultants, Building certifiers and surveyors, and architects.
- Over 20 years of **advocating** for the needs of deaf and hearing impaired people.
- Is a **life member** of Deafness Forum of Australia.
- Has won **numerous awards** for service in advocating for the needs of deaf and hearing impaired people.

### Legal

This document is not a legal interpretation of the NCC. It is the opinion of the principal of this company and is based on more than 30 years of experience with hearing augmentation. He himself is hearing impaired. The information provided is general advice only and does not take into account your building site objectives, building site design and or building materials used or other relevant factors and cannot be relied upon for your specific needs.

Therefore, Hearing Connections, its directors, agents and or employees do not accept any liability or responsibility arising in any way from the use of the information provided. The information should not be relied upon for accuracy or completeness. © Hearing Connections, 2020

