



## Sound Principles

### Rules of Thumb for Boundary Microphones

Specifically used in ceiling mics, boundary microphones, goosenecks, and suspended microphones, Clockaudio's C3 microphone element is one of the most versatile Clockaudio products that is useful for a variety of different applications.

Low profile, easy to install and connect, **Boundary Microphones** have been a favorite of users and integrators for many years. Renowned for their performance and reliability, they offer great intelligibility because they are usually installed in close proximity of the participants. Furthermore, the direct sound wave and the reflected sound wave hit the capsule almost simultaneously, resulting in a 6 dBs of boost and a cleaner signal. They come with either an omni-directional or cardioid pattern and can be integrated into almost any application.

A directional microphone (Cardioid, Hypercardioid, Super Cardioid, Figure-8 or Shotgun) has an axis, a point of direction from the capsule that is more sensitive than any other position. Usually the axis is perpendicular to the diaphragm of the mic element. When using one directional microphone for one person, the axis should be pointing straight at the person, putting them in the most sensitive part of the pattern. You can also capture 2 people very adequately by pointing the axis in between the two participants, putting each participant at equal distance from the capsule and the same off-axis angle.

It is very common to combine the "1 for 2" and "1 for 1" configuration on the same table, as some tables will have an odd number of seats on the sides. Symmetry must always prevail though, in a combined configuration, the 1 for 1 microphones are set at the same distance as the 1 for 2 participants (22" -24" from the edge of the table). Ideally, using 1 mic for 2 people is the goal, but trying to capture three people sitting side by side on a straight table at equal sound levels with one microphone is outright impossible, as the person sitting in the axis will be much louder than the two other people.

If the "1 on 1" configuration is planned for a conference table, microphones can be set as close as 18" from the edge of the table. Remember, the closer the mics are, the less gain is needed, this translates into less room noise being picked up and a cleaner signal to process.

For the 2 for 1 lay-out, microphones with a cardioid pattern will need a minimum distance of 22" from the edge of the table in order to pick up 2 participants adequately. As you move away from the microphone, the pattern widens but also weakens. The set gain should be higher than the 1 for 1 microphone.

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