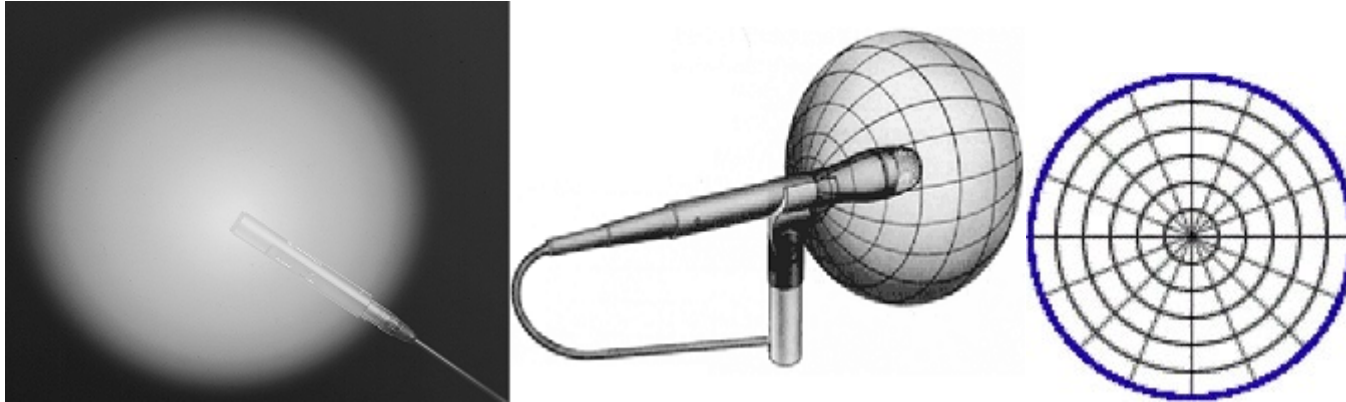




Microphone Directionality

✝ Church Audio ✝

Omni Directional



Different microphones are designed to hear differently. This helps us match them to suit different applications. We call this 'listening shape' the **Polar Pattern**.

Some microphones hear equally in all directions (omni-directional). This may seem an ideal situation, but it is usually the opposite. An omni-directional microphone will pick up what you placed it in front of, but also background noises, noises from the congregation, neighbouring instruments and loudspeakers (causing feedback squeal). Simplest solution: generally, avoid omni's 😞

Uni-Directional Cardioid



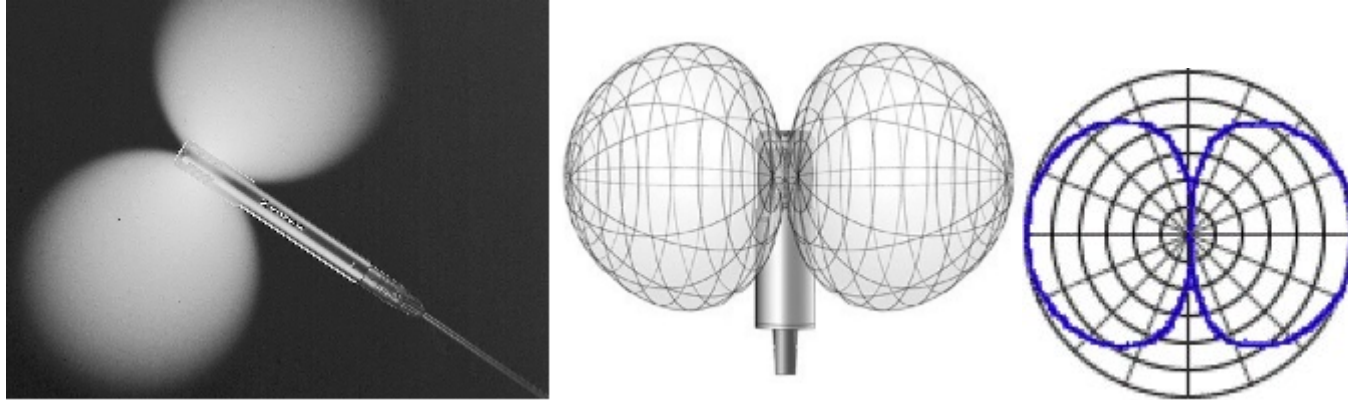
For most applications the ideal polar pattern is to only hear what is in front of the microphone. The Cardioid shape (Cardiac... Heart-shaped) is made for this. Because a cardioid mic doesn't hear things behind it, you can angle the microphone to hear exactly what you want to hear, and at the same time aim the rear to reject unwanted sounds. The width at the front is generous enough that a singer or musician can move about somewhat, and still be picked up.

Uni-Directional Super-Cardioid, Hyper—Cardioid



There are two 'tighter' versions of a Cardioid. The Super-Cardioid is more directional and hears less on the sides. The Hyper-Cardioid is the most directional and hears very little on the sides. A Drummer who sings should use a Super- or Hyper-Cardioid to minimise the drum sounds spilling in to the voice channel.

Bi-Directional Figure-of-Eight



Some microphones have two separate listening fields:

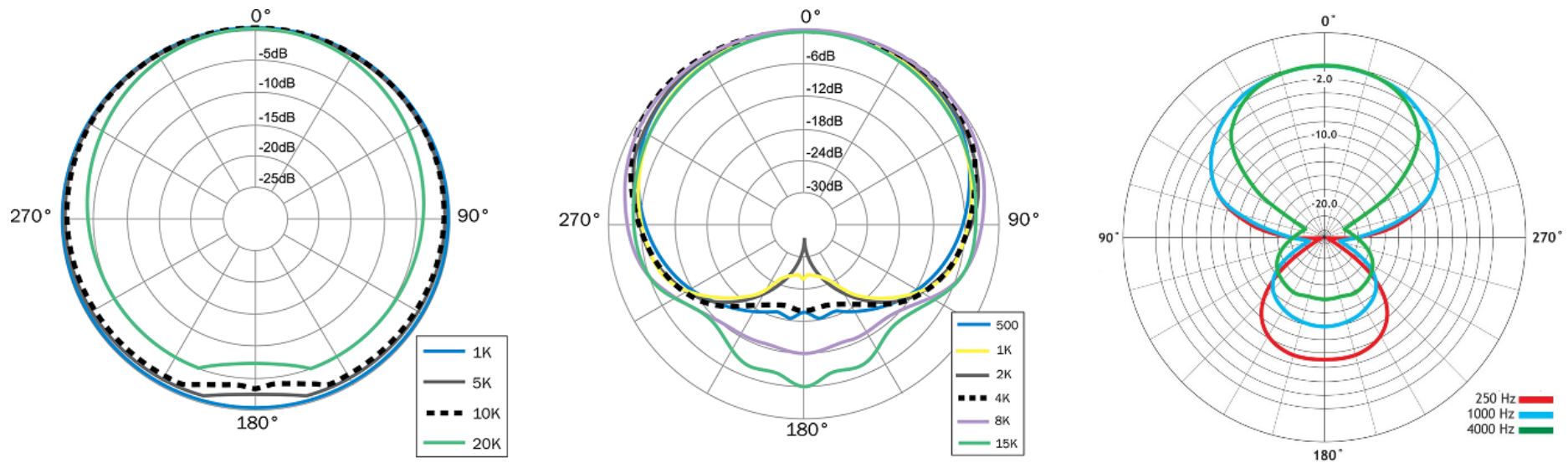
The '**Figure-of-Eight**' microphone hears on the two sides of its head, and then the result is added together. It connects to one microphone cable.

There is a '**Stereo**' microphone that lets you angle the two sides of its head to face where you like. It connects to two distinct microphone cables (eg. L and R).

**Some Microphones (especially Condensers)
may offer a choice of Polarities:**



All Microphones behave differently at different frequencies, consequently, their polarity figures will change slightly depending on the frequencies they are responding to.



It is not a dramatic difference, and under normal working conditions it isn't an issue.

Never block the holes on the side of a dynamic microphone as this how it creates its polarity.



Scenario #1: A Singer, wishing to be cool, cups their hands up underneath the wire-grill head of a dynamic microphone. This blocks off the directionality holes, and causes the microphone to become omni-directional. This will cause the microphone to start picking up the floor monitor and start squealing.

Scenario #2: A Singer notices a floor monitor is squealing. Fearful that it is their microphone they try to stop it by covering the entire wire-grill head of the dynamic microphone with their hands. This causes the microphone to become omni-directional. This will cause the microphone to start picking up the floor monitor and start squealing (whether it was squealing before or not).

SUMMARY:

How do I know which Polar Pattern a microphone might have?

Hold a microphone to your mouth. Speak in a constant volume and slowly rotate the microphone. You will hear the volume drop away at some point. It's good to do that with each model you have, though they might all be cardioid, you can know which are more directional and which are more generous.

Which Polar Pattern should you choose for the job?

99% of the time you should use a Cardioid (Uni-Directional) microphone. This is because normally you place your microphone "in front" of whatever you want to hear, and aim the microphone precisely at that sound. You generally don't want that microphone to hear anything else around about. Even groups of instruments, or a choir, still suit a uni-directional microphone because the microphone is placed back far enough to hear just the group you want... and nothing else!

CREDITS

This material is offered freely to the Christian Churches; downloadable at Pietango.com

Text: *Original, by the Author, a Christian Recording Engineer.*

Images: *Designed by the Author. Some photographs were sourced from the Internet, then re-worked.*

Ever since the creation of the world, God's invisible attributes and divine nature have been evident. They are clearly understood through his workmanship, and all the wonderful things that he has made. Therefore, those who fail to believe and trust in him are without excuse, or defence. **Romans 1:20**

All of us have sinned and fallen short of God's glory, but God treats us much better than we deserve.

Because of Christ Jesus, he freely accepts us and sets us free from our sins. God sent Christ to be our sacrifice. Christ offered his life's blood, so that by faith in him we could come to God. **Romans 3:23**

If you declare with your mouth, "Jesus is lord," and believe in your heart that God raised him from the dead, you will be saved. For it is with your heart that you believe and are justified, and it is with your mouth that you profess your faith and are saved. **Romans 10:9**

For the Scripture (*Isaiah 28:16*) says, "Whoever believes in Him will not be disappointed." **Romans 10:11**

These things have been written so that you may believe that Jesus is the Christ, the son of God; and that by believing, and relying on him, you may have new life in his name. **John 20:31**