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Recording Audio

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Introduction

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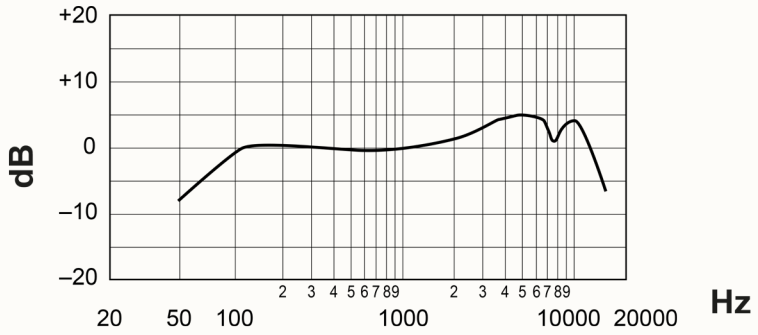
- In this presentation we will look at some ideas to achieve the best quality sound when using microphones.

- We'll first begin by looking at how microphones work, and then move on to some practical examples for common instruments.

- These are all just guidelines, and not always fixed rules, but they are a very useful place to start most of the time.

Frequency response

Every type of microphone has a frequency response. This is the ability of the microphone to handle each frequency supplied to it, and it is typically shown in a graph format, of frequency vs amplitude, like the one below. This is the frequency response of a dynamic microphone, the Shure SM58. The frequency response characterises each different microphone, as they all handle sound differently.



Polar Patterns

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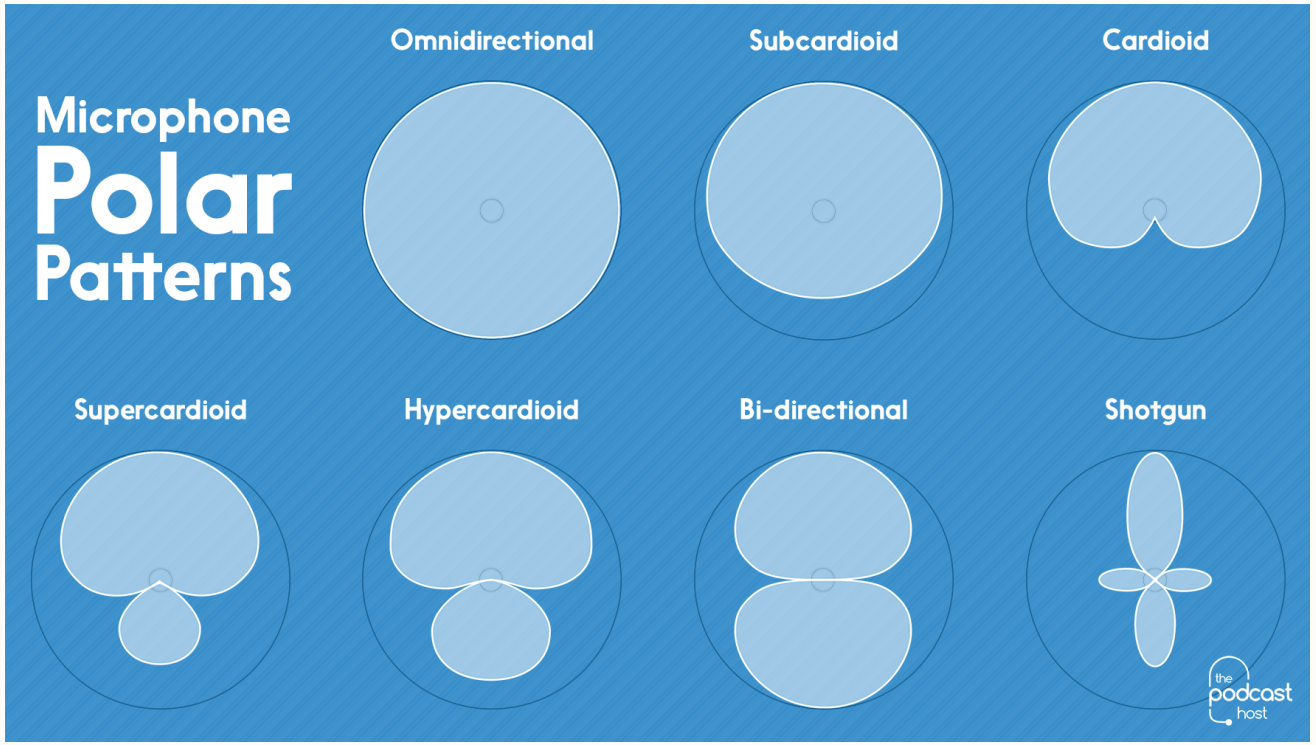
- As well as different frequency responses, different microphones have different polar patterns. A polar pattern is the area in which a microphone picks up sound, and there are a number of different options.

- The most common polar patterns are cardioid, figure 8 and omnidirectional.

The image below shows different polar patterns of microphones. Ribbon microphones are Bi-directional (Figure 8), but dynamic and condenser microphones can vary, or be switchable between different patterns.



Directionality & Proximity Effect

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- The frequency response of a microphone will change depending on the way a microphone is facing, and also how far away it is from the source.

- For example, microphones tend to pick up more bass and low end when the course is closer to them, so it could be a creative decision to move a more breath-y delicate singer closer to the microphone to increase the bass response.

Pad & Low Cut

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- Often, microphones will have a switch on the front which will allow the polar pattern to be changed.

- Another switch they're likely to have is a low cut. This cuts out the low frequencies from the signal, and allows the higher frequencies to pass through.

- Some microphones also have a -10 or -20 dB pad switch, which is useful when recording high SPL (very loud) sounds, as it can prevent the signal from distorting.

Microphone placement

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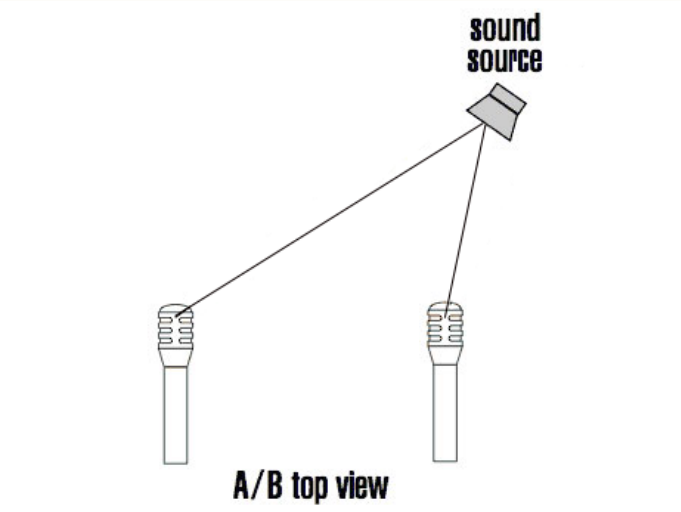
- Due to polar patterns, directionality and proximity effect have such an affect on frequency response. Microphone placement is a really important part of the recording process in terms of achieving the specific sound you're after.

- It's especially important when using two microphones to pick up a stereo signal.

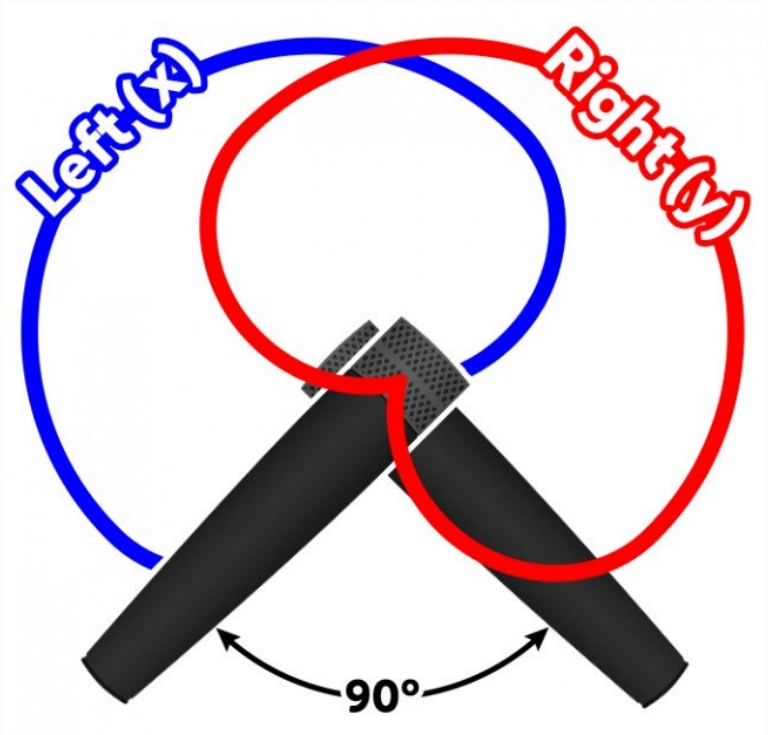
- We'll look at some simple stereo microphone placement techniques.

Spaced Pair



- A spaced pair is the most common stereo mic technique, and also the simplest to understand.
- It is essentially having two microphones spaced apart from each other, both picking up one sound source. It is very commonly seen used for drum overheads.
- It can work with microphones of any polar pattern, but is most commonly seen using cardioid or omnidirectional.

XY Pair



- An XY pair is a simple stereo microphone technique that allows an accurate stereo image of a source, as a listener might hear it in reality.
- It consists of two cardioid microphones placed one on top of the other, with a pre-determined angle of separation. The example on the left shows an angle of 90 degrees.
- This means the microphone on the left will pick up the sound on the right of the image, and vice versa.
- This technique work well for drum room mic'ing, and for close mic'ing of instruments.

Acoustic Guitar

A common approach to mic'ing an acoustic guitar is to use two small diaphragm condenser microphones as a stereo pair, with one pointing around the 12th fret, and one at the bridge. These will then blend together to create a well rounded image of the guitar's sound.

Guitar amp

Guitar amps

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- Most of the time, dynamic microphones are used for guitar amps.
- A good starting point with positioning is to place the mic a finger width away from the front grille of the amp.
- If you move the microphone toward the centre of the speaker, there will be more low end.
- If you move the microphone toward the edge of the speaker, there will be more high end.

Piano

Using two microphones inside the piano is the most common way to record a piano. It’s common to see one microphone used to pick up the lower notes on the piano, and one for the higher, which are then blended in post production.

Upright Piano

A similar example on an upright piano sees two small diaphragm condenser microphones used. One for the low end and one for the high.

Drums

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The Classic

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- The previous slide shows the “classic” approach to mic’ing drums. Each drum is close mic’d, with a snare top and bottom. The overheads are a spaced pair, which both point toward the centre of the snare drum.

- Variation is encouraged with this approach, as small changes can yield great results.

One mic approach

One Mic

- The one mic approach with drums works well when using one large diaphragm condenser, facing the tummy of the drummer.

- Drums can also be recorded effectively using one microphone as a mono overhead, again preferably a large diaphragm condenser.

- The one mic approach can be improved drastically with the addition of a kick drum mic.

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Thank You