

AUDIX

How to choose a microphone

Whether you are a vocalist in a rock and roll band, a Worship Leader at Church, a Director of a play needing sound reinforcement, a Motivational Speaker, a Concert Pianist or an Auctioneer; selecting the best microphone for your needed application is a challenge. The right microphone can make your performance or event sizzle and the wrong one can be one of the reasons you are not invited back to perform again.

There are a few guidelines to follow in order to make your next microphone purchase a satisfying endeavor. First of all, let's look at the types of microphones there are and what kinds of applications they are used for.

Microphone Types: There are four types of microphones, two of which are commonly used for live and studio music performance applications today: Dynamic microphones and Condenser microphones. The other two: Carbon and Crystal microphones, though rich in history, are not going to find themselves on two many stages or studios these days and will not be covered on this sheet.

1. **Dynamic Microphones:** These microphones are the predominant microphone used for live vocals as well as many, if not most, drum miking applications. There are two types of dynamic mics: Moving coil and Ribbon. Dynamic mics work on the principle of magnetic induction. They need no external power to run. The moving coil type of dynamic microphone is the one most often used today for vocal and instruments. Moving coil mics use a magnet, a coil wrapped with wire and a diaphragm that sits over the top of both. An electrical signal is generated by the physical motion of the microphone's diaphragm and the internal voice coil; as the diaphragm moves with the sound waves, the attached voice coil moves, translating its motion into an electrical signal. Instead of a coil and diaphragm, a ribbon microphone has a thin metal corrugated ribbon stretched across the magnetic field. Sound pressure hits the ribbon and moves it across the magnet. Ribbon microphones are not as commonly used as moving coil microphones today. There are some modern manufacturers that currently make ribbon microphones (primarily regarded as studio microphones). The older radio broadcast type of mic used in the 1930's and 40's was typically a classic RCA ribbon microphone. Though they can have a very natural sound, the size and durability of moving coil microphones as well as their higher output made them a much more viable solution to the growing



sound reinforcement needs over the last seventy years.

2. **Condenser Microphones:** These microphones have a much flatter frequency response than dynamic microphones and usually are more expensive. In a condenser microphone, the diaphragm itself is electrically charged, and the variations in the electrical field between the diaphragm and the condenser microphone element (which is also charged) generate a



corresponding electrical signal. Because of the electrical charge required by the microphone's elements, condenser microphones must be powered by either batteries or, more commonly, by 'phantom power' from a mixing board (almost always included with newer model mixing boards) or other external power source. The signal from a condenser microphone is very weak compared to a dynamic microphone so it must be amplified before it gets to the mixing board or studio console. Condenser microphones

contain an amplifier that boosts the signal before it leaves the mic. Condenser microphones are most often used for acoustic instrument miking (drum overheads, stringed instruments and percussion) and studio vocals.

What types of microphone pick up patterns are there and why is that important?

There are four basic microphone pickup patterns; Omni, Cardioid, Super-cardioid and Hyper-cardioid.

- **Omni-directional microphones** pick up sound from all directions equally. For this reason they may not be the right choice for many live applications since they are prone to cause feedback. They are popular for lapel mics, however, and some studio applications where they can add a very nice spatial effect.
- **Cardioid** refers to a heart shaped pattern (hence the Latin 'cardioid'). Picture a heart. The indented top of the heart would be the equivalent of the back of the microphone. In other words, Cardioid microphones block the sound from the rear. This gives them better ability to mic a specific area or instrument desired.
- **Super-cardioid** microphones have a tighter pickup pattern than a regular cardioid pattern and will block some additional sound from the sides.
- **Hyper-cardioid** microphones do the same thing with even a slightly tighter pattern than a super-cardioid. When miking instruments that are in close proximity to one another, such as a drum set, a hyper-cardioid pattern can help to isolate each individual drum or sound source. It can also reduce feedback from floor monitors as well. Most vocal microphones are either cardioid or hyper-cardioid pick up patterns.

What's next?

Now that you have determined that you want a dynamic microphone or a condenser, how do you decide which model and brand? Let me just concentrate on one rule of law; **DO NOT COMPROMISE TRANSDUCERS.** What does this mean? A transducer is a device that converts sound to electrical energy or visa versa. We are talking about microphones and speakers. Microphones convert sound into electrical energy and conversely, speakers take that electrical energy and convert it into sound! These two components are the most important considerations when budgeting for your sound system. Too often buyers get drawn into purchasing a fancy mixing board with fancy lights, bells and whistles and cut some serious corners by purchasing cheap microphones and/or speakers. Bad sound in ...Bad sound out! Try to get the best microphone you can. That will go a long way in not sacrificing what many consider the most important link in the sound chain.

...AND FINALLY consider:

- What type of warranty is provided? If there is no warranty, avoid it.
- Go to the manufacturer's website and explore spec sheets and reviews on the products that you are interested in.
- At the same website you may be able to see, in some cases, what microphones well known artists may use.
- Trust your ears. For example, you may have performed with a certain mic, brand and model that you really liked. When you pursued pricing on it you may have been drawn to a promotion that may save you a few dollars but wasn't and isn't what you want. Trust your ears!

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