

## WHAT YOU NEED TO KNOW ABOUT MICROPHONES

**Microphone types:** Mics are named for the type of element they have. There are three basic types. Moving coil, condenser, and ribbon.

1) Moving coil - the element consists of a coil of wire, attached to a diaphragm, suspended in a magnetic field. When sound waves move the diaphragm it moves the coil. When the coil moves in the magnetic field, a voltage is induced. This voltage is our audio signal.

*These mics are typically rugged. They can be used on drums or other high volume, percussive instruments. They don't overload very easily.*

2) Ribbon - the element consists of a metal ribbon, suspended in a magnetic field. When sound waves move the ribbon in the magnetic field, a voltage is induced. This voltage is our audio signal.

*Ribbon mics are usually less durable than moving coil types. They should not be exposed to high levels of sound. They tend to give a warm, mellow sound.*

3) Condenser - these mics consist of two plates separated by a small space. The plates form a capacitor. When sound moves the front plate, the capacitance of the plates change. This causes a voltage change. This voltage change is our audio signal.

*Condenser mics provide a rich, detailed sound with excellent frequency, and transient response. Suitable for vocals, acoustic guitars, cymbals. They may be slightly more susceptible to overload than moving coil mics. These mics need some kind of power supply. (either batteries or phantom power) They are sometimes known as capacitor mics.*

**Note:** Any mic which uses an electrical conductor suspended in a magnetic field to produce it's audio signal, may be called a dynamic mic. (thus either a ribbon or moving coil mic could be called a dynamic mic.)

### *A few definitions*

Microphone - a device which changes acoustic energy, (sound), to electric energy, (an audio signal).

Element - the part of the mic that changes acoustic energy to electric energy, .

Polar pattern - a representation of how well a mic hears sound from different directions.

Unidirectional polar pattern - picking up sound mostly from one direction.

Omnidirectional polar pattern - picking up sound equally from all directions.

Cardioid polar pattern- a heart shaped polar pattern. (it's unidirectional )

Frequency response - how well a mic hears different pitches.

Transient response - how quickly a mic can respond to sound.

Capacitor - a device which can store an electrical charge.

Phantom power supply - a circuit that sends DC voltage to a condensor mic.

### **Stereo microphone techniques**

These techniques are usually performed with a matched set of unidirectional mics.

Coincident miking: Place two mics, with their tips almost touching, one tip on top of the other, angled about 90 degrees apart.

*This set-up provides a sharp stereo image.*

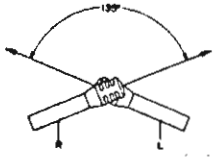
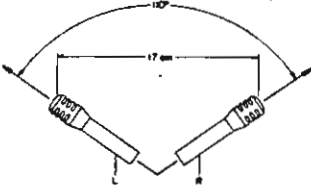
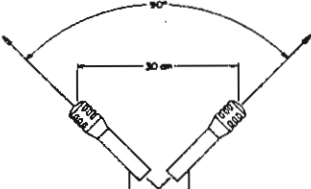
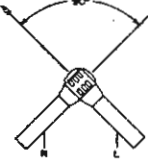
Near-coincident miking: The same as coincident, but move the mics a few inches apart. (the angle should be no greater than 90 degrees)

*Good depth and warmth with this technique. The stereo image is not quite as sharp.*

Spaced miking: two mics from several inches to several feet apart.

*Depending on the width of the sound source, mic placement, and acoustics, a very wide stereo effect can be achieved. Check for mono compatibility.*

Note: Coincident and near-coincident techniques are sometimes known as X-Y miking.

STEREO PICKUP SYSTEMS	MICROPHONE TYPES	MICROPHONE POSITIONS	
X-Y	2 - Cardioid	Axes of maximum response at 135°; spacing: coincident	
ORTF (French Broadcasting Organization)	2 - Cardioid	Axes of maximum response at 110°; spacing: 17 cm (7 in.)	
NOS (Dutch Broadcasting Foundation)	2 - Cardioid	Axes of maximum response at 90°; spacing: 30 cm (12 in.)	
Stereosonic	2 - Bidirectional	Axes of maximum response at 90°; spacing: coincident	
MS (Mid-Side)	1 - Cardioid 1 - Bidirectional	Cardioid forward-pointed; bidirectional transverse-pointed; spacing: coincident	