

## DYNAMIC AND CONDENSER

A microphone is a transducer that converts acoustical energy to electrical energy.

There are two types of mics at Media Loan; **dynamic** and **condenser**.

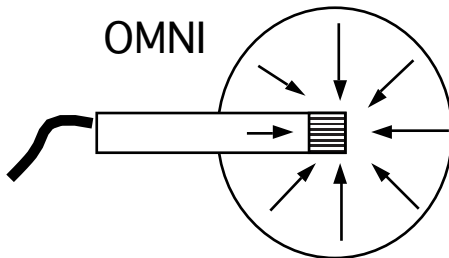
**Dynamic** mics are very rugged and can handle high sound pressure levels. They are slower to respond to transients.

**Condenser** mics are more sensitive and can pick up faster transients. They also require power. All of the condensers available in General Access can run off a battery. Some of the condensers can be powered from phantom power. Phantom power is a power source that is supplied through the mic cable from a mixer. The Shure M267 and Mackie 1202 Mixers in Audio Studio can supply phantom power.

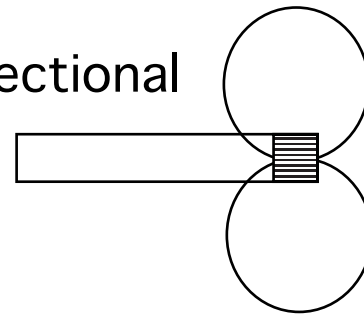
## PICKUP PATTERNS

The “pickup pattern” describes from which direction the mic picks up sound. All microphones respond to sound differently based on direction. This is called the mic’s pickup or polar pattern. The shape of the pattern tells you how sensitive the mic is to sound approaching from one direction. There are 3 basic patterns; **omni** directional, **bi** directional and **uni** directional. The uni directional category is broken down into **cardioid**, **supercardioid**, and **hyper cardioid**.

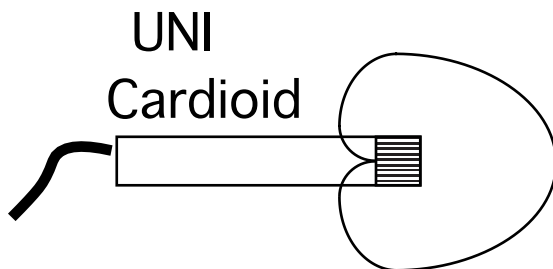
An **omni** directional mic picks up sound from all directions.



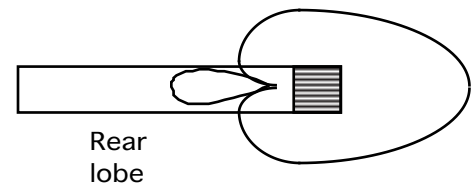
Bi Directional



A **bi** directional mic picks up sound from either side of the mic. There are no bi directional mics in Media Loan’s General Access equipment but some stereo mics make use of a bi directional element.

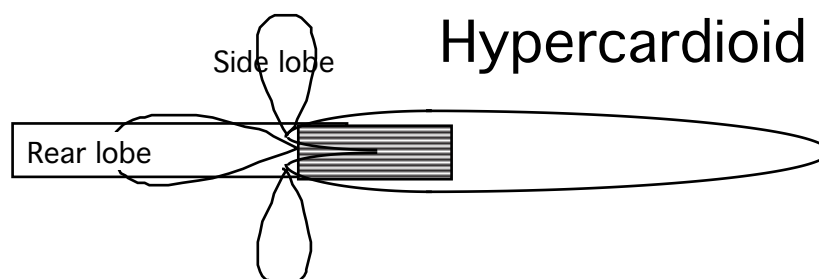


Supercardioid



**Cardioid** mics pick up sound in a heart shaped pattern in front of the mic. This allows you to focus on one sound while excluding other sounds. Also all directional mics are omni directional with low frequencies. This means that a cardioid mic may pick up low frequencies outside of its pick up pattern.

**Supercardioid** mics have a narrower pattern in the front but they also have a small lobe in the back of the pattern.



**Hypercardioid**, or **shotgun** mics have a very narrow pattern in the front. They have a rear lobe like the super cardioid but they also have lobes on the side of the mic. They are used to focus in a specific direction. You need to pay attention to the side lobes. If you are standing next to a noisy camera with a shotgun mic the side lobes might pick up the camera along with the intended sounds.

## PROXIMITY EFFECT

When most uni and bi directional microphones are placed close to a sound source the bass frequencies increase in level. This is called the proximity effect. Sometimes this is desired. People may speak into a mic that's close up to get a deeper sound out of their voice. Sometimes you may not want this sound. If you are recording someone who moves back and forth from the mic too much the bass sound of their voice may not be even. Some cardioid mics are designed to eliminate the proximity effect. The EV RE15, RE16 and RE18 are this way. They have a row of slots down the side of the mic. If they are covered up there will be the proximity effect. So be careful how you hold the mic.

## BALANCED AUDIO AND HI-LOWS

Audio signals can be carried on 2 types of cables; balanced and unbalanced. A balanced cable uses 2 wires for the audio signal and 1 for the shield. The 3 pin connectors of a mic cable is the most common example of a balanced cable. An unbalanced cable has 1 wire for the audio signal and 1 wire for the shield. Balanced signals are less likely to pick up extra noise and can be run for hundred's of feet if needed. Unbalanced signals are more likely to pick up noise but they are okay to use for short distances.

Most of the mics at Media Loan use balanced XLR connectors. A few of the mics have an unbalanced cable with a mini or 1/4" connector. A lot of our recording equipment uses unbalanced mini or 1/4" inputs. To convert from a balanced to an unbalanced signal you need a transformer. Media Loan calls its adaptors with transformers hi-lows. You need a hi-low to plug a mic with an XLR connector into a device with a mini input. This keeps the audio balanced from the mic to the hi-low. There is only a short section of unbalanced signal from the hi-low to the recorder. Media Loan has 1/4" and mini hi-lows. Make sure that you get the right type for your needs. Also, all of the mini hi-lows look like a stereo connector but they are really mono. If you use a hi-low with a stereo device like a mini-disc recorder or palmcorder it will only record to one of the 2 tracks and you will only hear it in one side of the headphones. This is normal.

## LEVELS

A microphone generates a very low level signal. It always needs to be amplified before we can use it. A mic level signal can range from -60 to -20db. The level of signal from devices such as vcrs and cassette decks is -10db. Some recorders have a special mic input which amplifies the mic signal to line level. If you plugged a CD player output into a mic input it would sound distorted. Some recorders such as the 4-track cassette recorders have inputs that can take a mic or line signal. But there is a mic preamp control on the recorder. It's normally called the trim control. You need to adjust this to set levels with a microphone.

## FILTERS

Some of the microphones have high pass filters. A filter removes specific frequencies from the audio signal. A high pass filter removes the low frequencies and is also called a bass roll off or a low cut. A low pass filter removes the high frequencies and is also called a high cut. Normally you want to wait until you have recorded a sound to do drastic equalization to it. But when you are recording the low frequencies that the mic picks up is usually garbage like mic handling noise or wind noise. So it can be a good idea to filter those frequencies out. The Sennheiser 421 has a 5 position bass roll off switch. The EV RE-15 and RE-16 have a 2 position switch. Media Loan also has XLR barrels that are high and low pass filters that you just plug the mic cable into.

## MEDIA LOAN'S GENERAL ACCESS MICROPHONES

### HANDHELD MICS

**EV 635A:** Dynamic, omni. A basic mic. Smooth response pattern, no proximity effect. XLR connector.

**EV RE15:** Dynamic, cardioid. Has a brightish feel. Good basic mic for voice. No proximity effect if the razor back (the slots on the back) are uncovered. There is a bass rolloff switch at the bottom of the mic. XLR connector.

**EV RE16:** Dynamic, supercardioid. Basically the same as the RE15 but supercardioid with a windscreen, making it appropriate for vocals and such. There is a bass rolloff switch at the bottom of the mic. XLR connector.

**EV RE18:** Dynamic, supercardioid. No proximity effect if the razor back (the slots on the back) are uncovered. XLR connector.

**SENNHEISER 421:** Dynamic, cardioid. Low Rolloff rotary collar on barrel by the XLR jack. M=Music (flat) S=Speech (maximum rolloff) This is an ideal mic for just about anything. It is good for musical instruments, singing and narration. XLR connector.

**SHURE SM57:** Dynamic. A good basic mic, used a lot for snare drums and guitars. XLR connector.

**SHURE SM58:** Dynamic. A very dependable mic. Same as the 57 except for the addition of a windscreen. Good for singing. XLR connector.

### SHOTGUN MICS

**SENNHEISER COMBO:** Condenser Multi-capsule. This mic comes with three interchangeable capsules; shotgun, cardioid, and omni. Requires phantom power or batteries. XLR connector.

**AUDIO TECHNICA ATR55:** Shotgun mic with a mono mini connector. Can also be switched to a cardioid pattern. It is a condenser mic powered by a AA battery.

**SENNHEISER MKE 300:** Shotgun mic with mono mini connector. It is designed to be mounted on a shoe mount on a palmcorder. It is a condenser mic powered by a battery.

### LAVALIER MICS

**SONY ECM50:** Condenser, omni. Requires a battery in the XLR plug body. This is a lavalier, ie. small lapel mic. Normally this is used for voice attached to a person's shirt. Can also be used on musical instruments.

**RADIO SHACK:** This is an omni condenser. It is powered by a battery. This has a mono mini connector.

### MISC

**SOUNDGRABBERS:** This is a PZM mic. It's a condenser that requires a battery. This is a flat mic that is designed to lie on a table or be taped to a wall. It is good for ambient recordings. Media Loan has 2 models. One has a mono mini connector and the other has a mono 1/4" connector. Make sure that you have the right connector or an adaptor.

**SONY ECM-MS907:** This is a stereo mic with adjustable width of the stereo image. It has a cardioid pickup and a bi directional pickup. They are combined for the stereo pattern. It is powered by a AA battery. It has a stereo mini connector. Good for stereo recording with palmcorders, min-disc recorders, and the Sony porta-dats.

## Family of Levels

