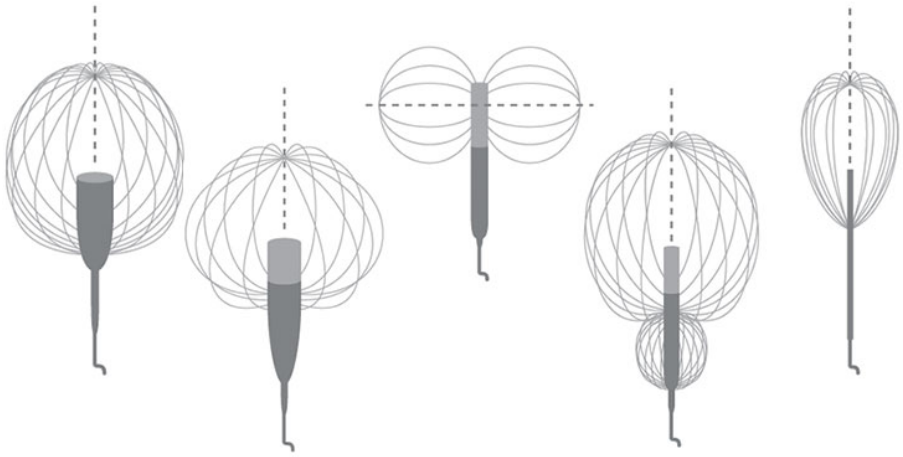
emily carr
university of art + design

Audio Visual Department



Microphone Notes

2013

DYNAMIC MICROPHONES

Brand	Model	Pattern	Access	Page
AKG	D 130	Omnidirectional	All-access	3
AKG	D 190	Cardioid	All-access	**4**
AKG	D 202	Cardioid	All-access	**5**
Audio Technica	AT 804	Omnidirectional	All-access	**6**
Electrovoice	EV 635	Omnidirectional	All-access	**7**
Shure	Beta 57	Cardioid	All-access	**8**
Shure	Beta 58	Cardioid	All-access	**9**
Shure	SM 57	Cardioid	All-access	**10**
Shure	SM 58	Cardioid	All-access	**11**

CONDENSER MICROPHONES

Brand	Model	Pattern	Access	Page
Crown	PZM 180	Omnidirectional	All-access	**12**
AKG	C 1000	Cardioid	*Restricted*	**13**
Audio Technica	AT 4053	Hyper-Cardioid	*Restricted*	**14**
Earthworks	TC 30	Omnidirectional	*Restricted*	**15**
Rode	NT 1	Cardioid	*Restricted*	**16**
Senheiser	ME 64	Cardioid	*Restricted*	**17**
Shure	SM 81	Cardioid	*Restricted*	**18**

LAVALIER MICROPHONES

Brand	Model	Pattern/Type	Access	Page
Shure	SM 83	Omnidirectional	All-access	**19**
Sony	ECM 44	Omnidirectional	All-access	**20**
Senheiser	EW 112-p	Wireless	*Restricted*	**21**

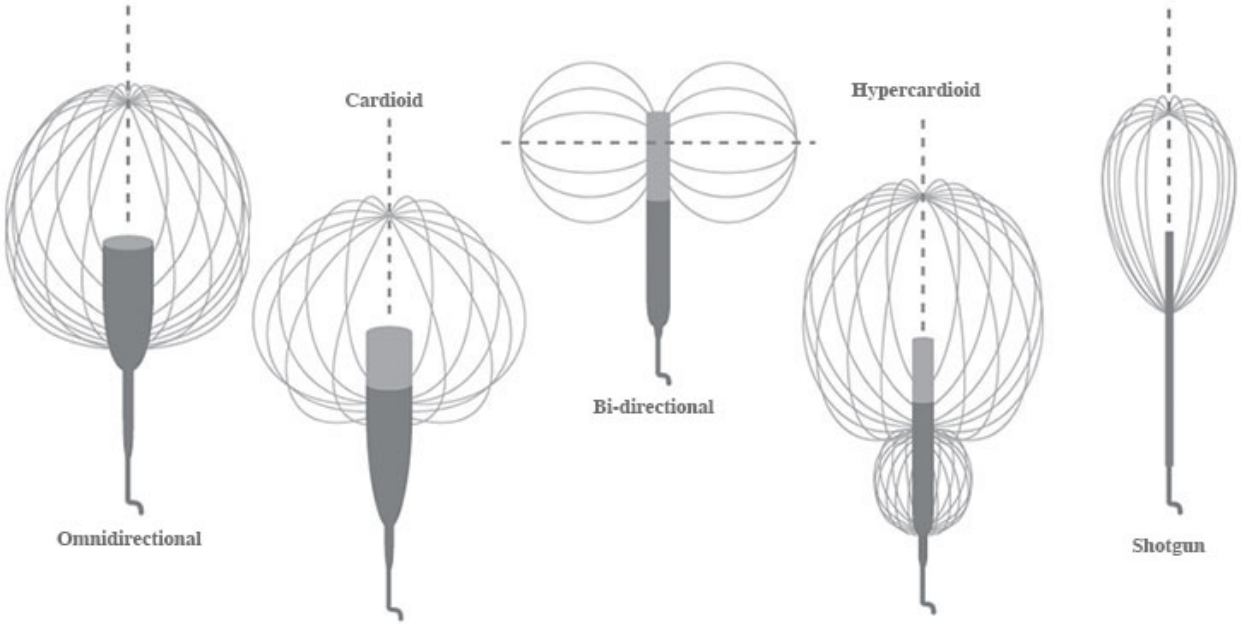
SHOTGUN MICROPHONES

Brand	Model	Access	Page
Audio Technica	AT 835	All-access	**22**
Audio Technica	AT 897	All-access	**23**
Senheiser	ME 66	*Restricted*	**24**

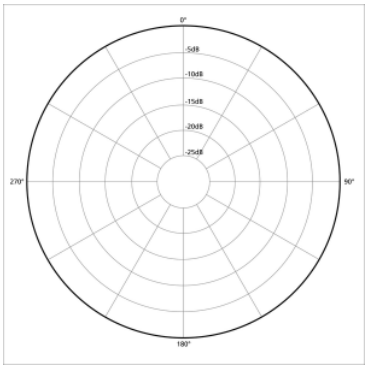
Choosing a Microphone

Polar Patterns

A polar pattern describes how a mic picks up sound. Each type of microphone will pick up sound from different directions in different ways. For instance, a bi-directional mic will pick up sound in front and behind but will pick up less sound from the side. The polar pattern for this kind of mic will appear like a figure-8 (the mic in the middle of the image).

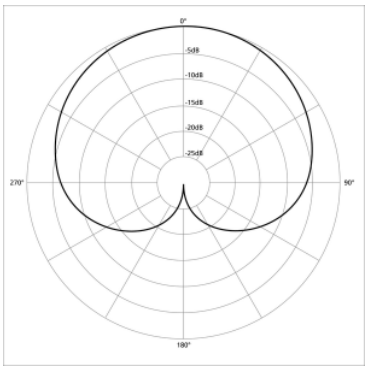


Omnidirectional Mics



A microphone that pics up sound from all directions is known as omnidirectional. They're generally pretty cheap at your neighborhood electronics store.

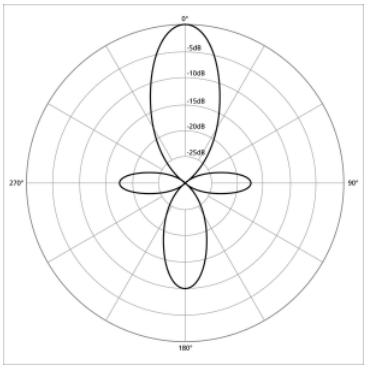
One of the better uses for this mic is to pick up and record ambient sounds. They are not ideal for recording dialogue, however, as the mic will also pick up any sounds nearby as well.



Cardioid Mics

The most popular kind of unidirectional mic is the cardioid mic. A unidirectional mic will capture all of the sound in front of the mic and very little behind the mic. While this sounds like a great mic to use for picking up audio for dialogue, it's not. In order to pick up dialogue successfully, you'd need to place it 3 to 6 inches away from the subject's mouth, and it would still pick up sound from the side.

Shotgun Mics



Like a cardioid mic, a shotgun mic will capture the sound in front of the mic. Unlike the cardioid, however, the shotgun mic is designed to minimize sound from the side and rear.

The range at which it can pick up sound is also much higher and can record crisp dialogue from 1 foot to as much as 4 feet away. That allows the mic to be just out of frame when capturing audio.

The Lav

The lavalier mic is a very small cardioid microphone that is wired to a battery powered transmitter. Usually the transmitter is clipped to a belt and hidden out of frame. The lav's mic itself is hidden as well, usually under a tie next to the speaker's sternum. Now you know why so many characters in film wear ties! You can also hide it under a shirt by taping it directly to the chest. This allows you to not only capture the voice but the low-end resonance from their chest as well. Your actors will have to be careful not to tap their chests or ruffle any clothing as the lav will pick up those noises as well.

DYNAMIC MICROPHONES

AKG D130

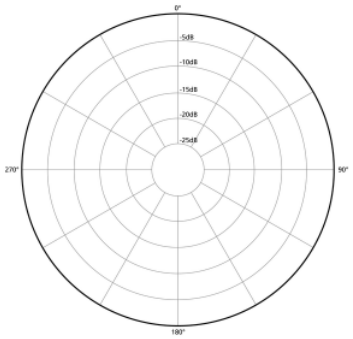
Make: **AKG**

Model: **D130**

Type: **Dynamic**

Pattern: **Omnidirectional**

Output: **Medium**



A very workable begginer's microphone for recording voice.

It has a frequency response that accentuates the upper midrange, so it helps with the understandability of the human voice. However it can make some sound sources, like piano and guitar, sound strident or jangley.

It is pretty sensitive to handling or mechanical noises and its output is in the medium range, so it is very easy to use when you want to record more than one person with just one microphone.

AKG D190

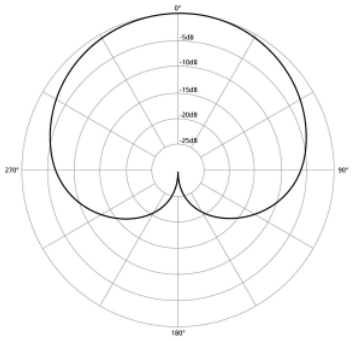
Make: **AKG**

Model: **D190**

Type: **Dynamic**

Pattern: **Cardioid**

Output: **Low**



A good choice for instrument and sound effects recording, and will do a decent job on voice recordings.

The frequency response of this microphone is very flat, for a dynamic cardioid microphone. It has a gentle roll-off of sensitivity to bass so it compensates a bit for the bass boost that cardioid microphones have when used within a few inches of a sound source.

It isn't overly sensitive to handling or mechanical noises, so it works well as a hand-held microphone. It also has a wider pick-up pattern than most other cardioid microphones, so has been a favorite hand-held interview microphone in radio and TV news.

This microphone has a fairly low output level, so should be used close to the sound source you are recording. It is a bit better at recording very quiet sounds than the SM57.

AKG D 202

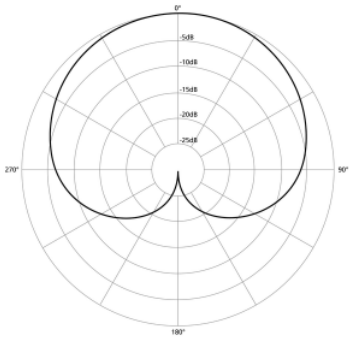
Make: **AKG**

Model: **D 202**

Type: **Dynamic**

Pattern: **Cardioid**

Output: **Medium**



A high-quality microphone, very good for recording instruments, sound effects and narration.

It has an extremly wide frequency response, going much deeper into the bass range and much higher into the treble range than most dynamic microphones. It sounds almost like a condenser microphone.

It is not a great choice for beginners to use, as it picks up so many sounds that most dynamic microphones don't that it tends to freak people out when they first listen to it.

It is sensitive to handling noise and to wind noise, so it isn't good for hand-held and outdoor recording.

It has medium-low output level, so it has to be used close to the sound source or for relatively loud sounds. It has a good bass filter for compensating for bass boost when used between 8 inches and a foot away from a person talking.

AT 804

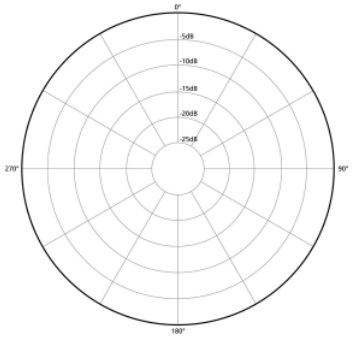
Make: **Audio Technica**

Model: **AT 804**

Type: **Dynamic**

Pattern: **Omnidirectional**

Output: **Medium**



A good choice for beginners, this microphone will make a reasonable recording of almost anything, and is very forgiving of mistakes.

It has an even frequency response, with a bit of increased sensitivity in the upper treble range. It will work fine with voices, but can also be used for instruments or sound effects.

It is not very sensitive to handling noise and is a good choice for hand held recording. It is also good at rejecting wind noise, so it‘s a handy microphone for outdoor recordings.

While it is rated as a medium output microphone, it has the highest output of all of our dynamic microphones (18 dB higher than the SM57) so it can be used with quiet talkers and low level sound sources.

EV 635

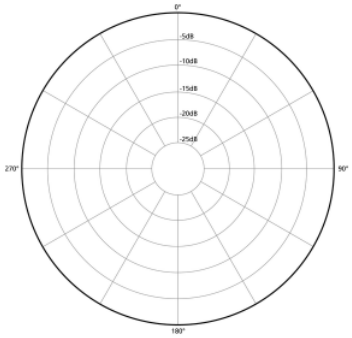
Make: **Electrovoice**

Model: **EV 635**

Type: **Dynamic**

Pattern: **Omnidirectional**

Output: **Low**



A good choice for beginners, especially for voice recordings.

It has a reasonably flat frequency response, that doesn't go very deep in the bass end or very high in the treble range, but covers the human voice completely.

It is not very sensitive to handling noise, mechanical noise or wind noise, so it makes a good handheld microphone and can be used outdoors without too much worry.

It has no bass boost when used very close to a sound source, and is not very sensitive to p-popping and sibilance. Used within a few inches of a person's mouth, it can produce useable voice recordings in noisy or echo-heavy rooms when more sophisticated microphones wouldn't.

A very forgiving microphone, the only strict rule is "get it close".

Beta 57

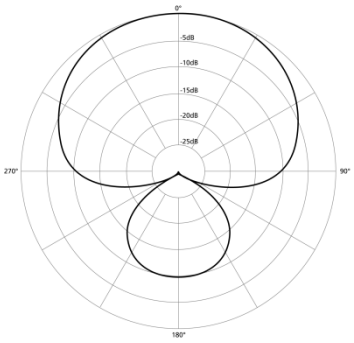
Make: **Shure**

Model: **Beta 57**

Type: **Dynamic**

Pattern: **Super-Cardioid**

Output: **Low**



Good for voice and instrument recording, particularly amplified instruments.

It is relatively insensitive to handling noise and can be easily used hand-held.

It has a relatively wide and flat frequency response, and moderate bass boost when used within 8 inches of a sound source.

It can be used on very loud sources without distorting and the built in pop filter is effective.

It is a bit more directional than a cardioid microphone.

Beta 58

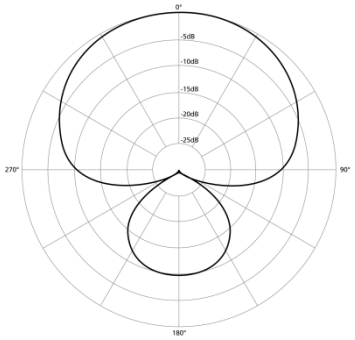
Make: **Shure**

Model: **Beta 58**

Type: **Dynamic**

Pattern: **Super-Cardioid**

Output: **Low**



A good voice recording microphone.

It is relatively insensitive to handling noise and can be easily used hand-held.

It has frequency response that accentuates the upper midrange, the frequencies that make human speech intelligible, so it is a good choice for voice. It isn't a great choice for most instruments or sound effects.

It should be used between 8 inches and a foot from your subject's mouth because it has a pronounced bass boost if used too close, but has low overall sensitivity so it can't be too far away.

It can be used on very loud voices without distorting. The built in wind screen is very effective. A good choice for recording people who don't have a lot of experience using microphones.

It is a bit more directional than a cardioid microphone.

SM 57

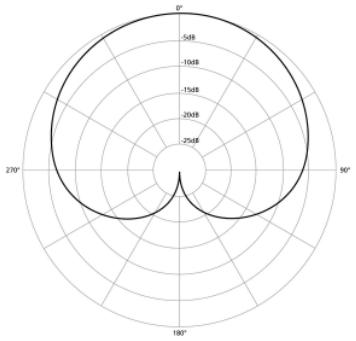
Make: **Shure**

Model: **SM 57**

Type: **Dynamic**

Pattern: **Cardioid**

Output: **Low**



A good all-purpose microphone, and a great one for beginners to use because it will make a decent recording of almost anything and is very forgiving of mistakes.

It has a low output level, so it doesn't do a great job of recording quiet sounds and it should be placed fairly close (8 inches to a foot) when recording somebody speaking. The other side of this coin is that it can do a great job of recording very loud sounds without distorting.

It isn't overly sensitive to handling or mechanical noises, so works well as a hand-held microphone.

It has a pretty good high-frequency response, so it works well for recording musical instruments and sound effects. It's high frequency response and its ability to handle loud sounds make it a popular microphone for recording drums and percussion instruments.

It does have a very noticeable bass boost if it is placed closer than six inches or so to a sound source. To record a natural sounding voice, it should be placed at least eight inches away from the person's mouth.

SM 58

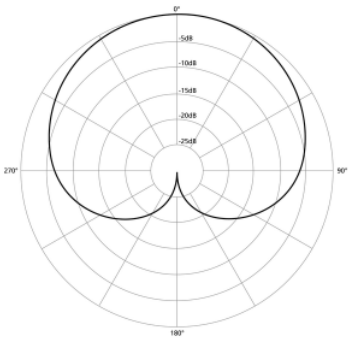
Make: **Shure**

Model: **SM 58**

Type: **Dynamic**

Pattern: **Cardioid**

Output: **Low**



A workhorse voice recording microphone.

The frequency response of this microphone has an increased sensitivity in the upper-midrange frequencies, the ones that are most important for us to understand words. That makes this microphone very good for recording voices.

It isn't overly sensitive to handling or mechanical noises, so it works well as a hand-held microphone.

It does have a very noticeable bass boost if it is placed closer than six inches from a sound source. To record a natural sounding voice, it should be placed at least eight inches away from the person's mouth. It has a pretty low output level, so it shouldn't be placed more than about a foot away from your subject's mouth.

It wouldn't be the first microphone choice for recording instruments or sound effects. Not a good choice for ambient recordings.

CONDENSER MICROPHONES

PZM 180

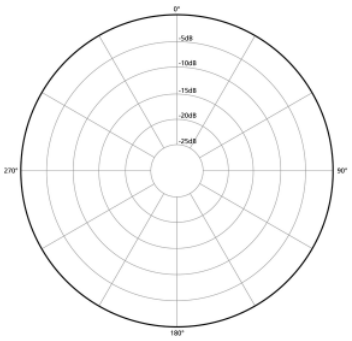
Make: **Crown**

Model: **PZM 180**

Type: **Condenser Boundary**

Pattern: **Omnidirectional**

Output: **Medium**



A specialized microphone, very useful for recording meetings, performances and ambient sounds.

It is designed to be placed on a flat surface to pick up sound over a large area without the hollow quality that more conventional microphones produce in these circumstances.

Its frequency response depends on its placement – the larger the area of the surface it is placed on, the more sensitive it is to bass frequencies. It has increased sensitivity in the upper treble range.

It is a good microphone for stereo recording of ambiance or sound effects.

Sometimes it is the only microphone that will produce intelligible voice recordings of large groups in a reverberant room.

Battery powered.

AKG C1000

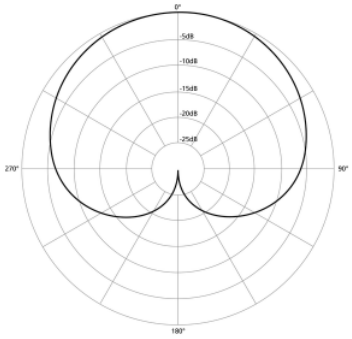
Make: **AKG**

Model: **C1000**

Type: **Condenser**

Pattern: **Cardioid**

Output: **Medium**



The versatility of the C1000S makes this an extremely popular model and one ideally suited for all kinds of recording and live sound applications.

It has extended bass and treble response, and a bit of an increased sensitivity to the high midrange, so it will help with the intelligibility of voices.

It can also be used to record instruments, sound effects and ambience. A pair of these microphones would work well for stereo recording.

It is not so sensitive to handling noise, wind noise and mechanical sounds than most condenser microphones, so it can be used hand-held.

It needs phantom power.

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS

AT 4053

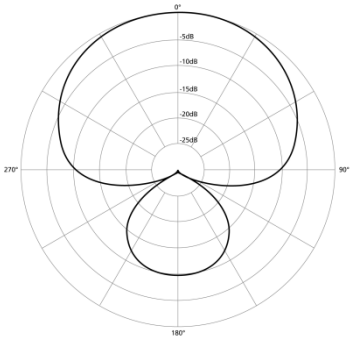
Make: **Audio Technica**

Model: **At 4053**

Type: **Condenser**

Pattern: **Hyper-Cardioid**

Output: **High**



The shotgun microphone for beginning boom operators on film or video productions.

It is a real shotgun microphone, designed to be used two or three feet away from an on-camera actor (and just outside the picture frame) but it doesn't require as much expertise to get a useable recording. The "sweet-spot" is wider than most other shotgun microphones. It isn't nearly as sensitive to handling and mechanical noises as either of the Sennheisers.

It is, however, sensitive to wind noise so the foam wind sock has to be used outdoors.

It has a flat frequency response on-axis, but a very uneven frequency response from the side and back. It may not be useable in small and reverberant rooms.

It has a lower output level than either of the Sennheiser shotguns and it is a bit less directional, so it doesn't have as much reach – it has to be closer for the same quality recording.

It is battery powered (doesn't require phantom power).

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS

TC 30

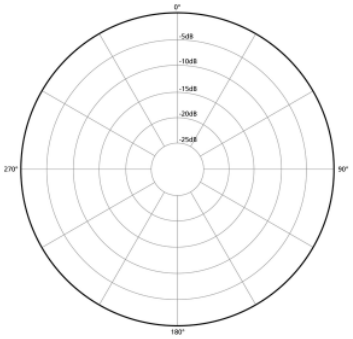
Make: **Earthworks**

Model: **TC 30**

Type: **Condenser**

Pattern: **Omnidirectional**

Output: **Medium**



A specialty microphone for stereo and ambient recordings (distributed by AV as a pair).

This microphone has an extremely wide frequency response, especially in the treble range – it is able to pick up sounds several octaves above our hearing range. It has the most realistic sound of any of the microphones we have, too realistic for many applications.

It is sensitive to handling and mechanical noise, so should be used on a stand. It isn't particularly sensitive to wind noise, it can be used outdoors when many other microphones would be overwhelmed.

The capsule is very delicate – **do not touch the capsule end of this microphone, you could destroy it.**

It needs 48-volt phantom power to operate.

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS

NT 1

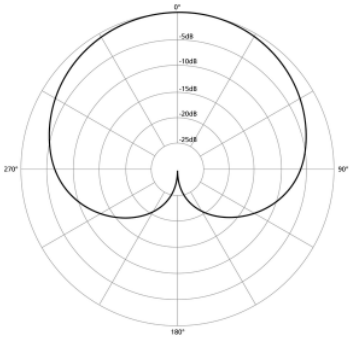
Make: **Rode**

Model: **NT 1**

Type: **Condenser**

Pattern: **Cardioid**

Output: **High**



A specialty microphone for studio recording of voice and instruments.

It is a cardioid condenser microphone with a large capsule. It has a frequency response that rises in sensitivity through the treble range. It gives a larger-than-life feeling to voices and instruments. A good choice for recording narration.

It is extremely sensitive to handling and mechanical noise, particularly in the bass range, so it must be used on a microphone stand with the shock mount that comes with it.

It will accentuate p-popping, sibilance, mouth sounds, and lip noises, so it may not be the best choice for recording inexperienced narrators. It should always be used with a pop filter when recording voices. It has an extreme bass boost when used close to a sound source.

It needs 48-volt phantom power. Some mixers or recorders supply lower voltage phantom power, this microphone will not work with them.

It is very fragile and must be treated gently and with extreme care.

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS

ME 64

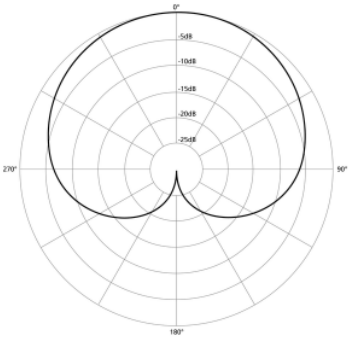
Make: **Senheiser**

Model: **ME 64**

Type: **Condenser**

Pattern: **Cardioid**

Output: **Very High**



A cardioid condenser microphone for instrument, sound effects and ambient recording.

This microphone has an extended frequency response, with increased sensitivity in the upper treble. It is an excellent microphone for recording delicate sounds or ambiance. It can be a decent voice microphone, but should be used at least a foot away. It may accentuate sibilance as well as mouth and lip sounds.

It is very sensitive to handling and mechanical noise, so it isn't a good choice for hand-held use.

It has an extremely high output level. This makes it a good choice to use with MiniDV video camcorders, but increases the chances of getting distortion on loud sources.

This mic requires phantom power.

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS

SM 81

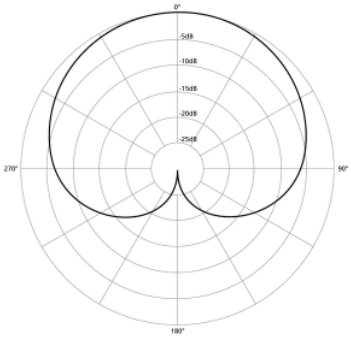
Make: **Shure**

Model: **SM 81**

Type: **Condenser**

Pattern: **Cardioid**

Output: **Medium**



A very good instrument and sound effects microphone. Especially good for plucked instruments (acoustic guitar, mandolin) and hammered instruments (marimba, vibes). With the metal pop filter, a decent voice microphone. A good choice for stereo techniques and ambient recordings.

It is moderately sensitive to handling and mechanical noise, but if used with care can be used hand-held.

It has a very flat frequency response – the flattest of any of our cardioid microphones. It has extended bass and high frequency response.

It has a useful bass cut filter with two settings, one which will compensate for the bass boost that comes from using it within 8 inches of the sound source, the other which will cut out a lot of rumble from wind noise and nearby cement plants.

Its overall sensitivity is moderately high (13 dB more than the SM57) so can be used for quiet sound sources.

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS

LAVALIER MICROPHONES

SM 83

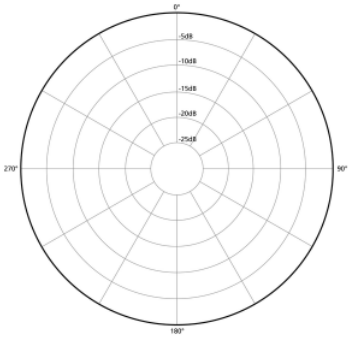
Make: **Shure**

Model: **SM 83**

Type: **Condenser Lavalier**

Pattern: **Omnidirectional**

Output: **Medium**



A clip-on lavalier microphone for on camera voice recording in video and film.

It has a frequency response that is specifically designed for this use – the bass frequencies are cut and the high frequencies boosted to make it sound good when pinned onto somebody's chest.

It is very sensitive to handling noise and nearby noise sources, like jewellery rattling and clothing rustling, so has to be used carefully.

Because it can be placed so close to the person speaking, it is a very good choice for noisy environments or for rooms with a lot of reverberation, like an Emily Carr seminar room.

The SM83 is a moderately sensitive microphone, so it can be used for quiet individuals.

However, this increased sensitivity and its omni-directional pickup pattern make it very susceptible to feedback, so it shouldn't be used with a public address system.

Battery powered.

ECM 44

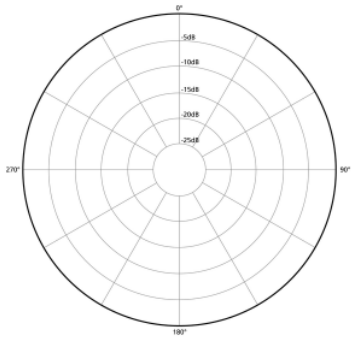
Make: **Shure**

Model: **SM 83**

Type: **Condenser Lavalier**

Pattern: **Omnidirectional**

Output: **Medium**



A clip-on lavalier microphone for on camera voice recording in video and film.

It has a frequency response that is specifically designed for this use – the bass frequencies are cut and the high frequencies boosted to make it sound good when pinned onto somebody's chest.

It is very sensitive to handling noise and nearby noise sources, like jewellery rattling and clothing rustling, so has to be used carefully.

Because it can be placed so close to the person speaking, it is a very good choice for noisy environments or for rooms with a lot of reverberation, like an Emily Carr seminar room.

The ECM44 is a moderately sensitive microphone, so it can be used for quiet individuals.

However, this increased sensitivity and its omni-directional pickup pattern make it very susceptible to feedback, so it shouldn't be used with a public address system.

EW 112-p

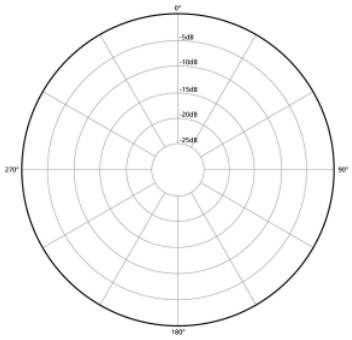
Make: **Senheiser**

Model: **EW 112-p**

Type: **Condenser Lavalier**

Pattern: **Omnidirectional**

Output: **Medium**



A clip-on lavalier microphone for on camera voice recording in video and film.

A great alternative to the wired lavalier microphones, this wireless lavalier set makes it easier to capture good dialogue in difficult conditions, or at a distance. Perfect for outdoor interviews on a windy day, or on outdoor film shoots for dialogue.

The EW 112-p uses a radio transmission signal to send the sound picked up by the transmitter, to the receiver, which is plugged into the recording device.

You will need four AA batteries to operate this wireless lavalier microphone set.

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS

SHOTGUN MICROPHONES

AT 835

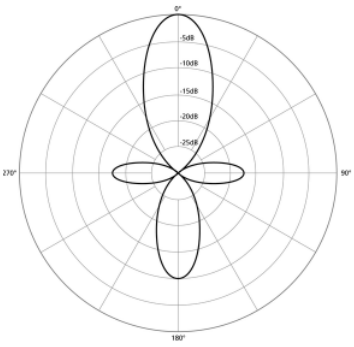
Make: **Audio Technica**

Model: **At 835**

Type: **Condenser**

Pattern: **Shotgun**

Output: **High**



The shotgun microphone for beginning boom operators on film or video productions.

It is a real shotgun microphone, designed to be used two or three feet away from an on-camera actor (and just outside the picture frame) but it doesn't require as much expertise to get a useable recording. The "sweet-spot" is wider than most other shotgun microphones. It isn't nearly as sensitive to handling and mechanical noises as either of the Sennheisers.

It is, however, sensitive to wind noise so the foam wind sock has to be used outdoors.

It has a flat frequency response on-axis, but a very uneven frequency response from the side and back. It may not be useable in small and reverberant rooms.

It has a lower output level than either of the Sennheiser shotguns and it is a bit less directional, so it doesn't have as much reach – it has to be closer for the same quality recording.

It is battery powered (doesn't require phantom power).

AT 897

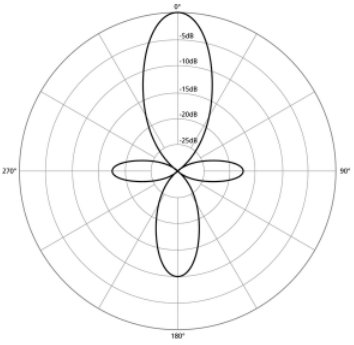
Make: **Audio Technica**

Model: **AT 897**

Type: **Condenser**

Pattern: **Shotgun**

Output: **High**



A shotgun microphone for video production.

It is a real shotgun microphone, designed to be used two or three feet away from an on-camera actor (and just outside the picture frame) but it doesn't require as much expertise to get a useable recording. The "sweet-spot" is wider than most other shotgun microphones. It isn't nearly as sensitive to handling and mechanical noises as either of the Sennheisers.

It is, however, sensitive to wind noise so the foam wind sock has to be used outdoors.

It has a flat frequency response on-axis, but a very uneven frequency response from the side and back. It may not be useable in small and reverberant rooms.

It has a lower output level than either of the Sennheiser shotguns, and it is a bit less directional, so it doesn't have as much reach – it has to be closer for the same quality recording.

It is battery powered (doesn't require phantom power).

ME 66

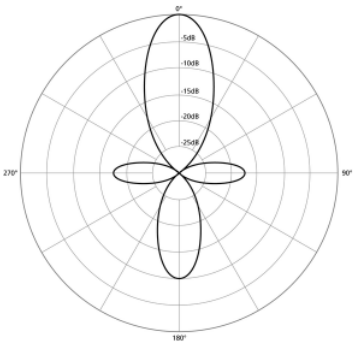
Make: **Senheiser**

Model: **ME 66**

Type: **Condenser**

Pattern: **Shotgun**

Output: **Very High**



Our best shotgun microphone for film or video production.

This microphone has good reach, designed to be used 2 or 3 feet away from an on-camera actor. It has a fairly narrow sweet-spot for on-axis pickup, so it isn't a great choice for a beginning boom operator.

It has a wide and flat frequency response on-axis, but the off-axis response is very uneven. It may be unsuitable for use in small or highly reverberant rooms.

It is very sensitive to handling and mechanical noise, so it must be used with a shock mount. It is moderately sensitive to wind noise, so the foam wind sock should be used outdoors.

It has an extremely high output level. This makes it a good choice to use with MiniDV video camcorders, but increases the chances of getting distortion on loud sources.

It is battery powered (doesn't require phantom power).

THIS IS A RESTRICTED MICROPHONE

STUDENTS MUST BE CLEARED FOR RESTRICTED MIC ACCESS