



JAVS PERSPECTIVES SERIES:

EFFECTIVE USE OF DIGITAL RECORDING
TECHNOLOGY IN THE LEGAL SYSTEM

PICKING THE RIGHT MICROPHONE FOR COURT RECORDING:

A GUIDE FOR
JUDGES AND
COURT
PERSONNEL

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The method of making a court record with microphones should be an easy process. It should not take a lot of the judge's effort to make it happen, nor be so technically complicated that only a select few operators must be available to make the recording method work.

EXECUTIVE SUMMARY

When selecting microphones for the courtroom, it is easy to get lost in the technical details. This guide explains in plain English for judges and court personnel what is truly important in selecting microphones for an audio or audio/video system to ensure an accurate and complete record of court proceedings.

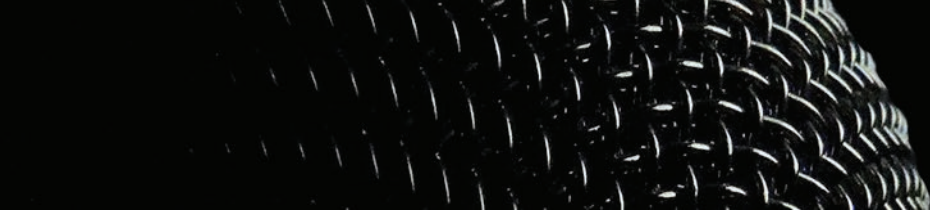
THE JOB OF MICROPHONES IN THE COURTROOM

The audio system in a courtroom has an important and specialized job. Fundamentally, it needs to be able to pick up human voices at different locations in the courtroom to create an audible, clear recording that can serve as the official court record.

Audio recording systems typically contain a **microphone** to collect the sound waves, **preamplifiers** (the devices which “accept very low-level signals and amplify them without adding appreciable noise”)², a **mixer** to allow multiple sound signals to be combined into a single signal, and a **recorder** to record the signal. Together these components of the A/V system ensure an accurate court record.

There are often multiple people who speak during a court proceeding and all of them must be registered accurately by the A/V system. Attorneys need to be heard clearly when they move around the courtroom, and those who speak more loudly than others, or who speak at the same time, should be heard clearly as well. All legal personnel in the courtroom must be able to know at a glance whether microphones are—or are not—recording and thereby actually creating the court record.

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It can be just as important to stop a microphone from picking up certain sounds as it is to accurately record other sounds. Filters in the audio system might be necessary to remove noise such as air conditioners and computers. Most importantly, attorneys and judges must be able to mute microphones as needed for attorney-client conversations and conversations at the bench that are not meant for the ears of the jury.

The method of making such a court record with microphones should be an easy process. It should not take a lot of the judge's effort to make it happen, nor be so technically complicated that only a select few operators must be available to make the recording method work.

HOW TO GET GOOD AUDIO FROM COURTROOM MICROPHONES

If the choice of microphones seems complicated, know that audio/video technicians will guide the selection of the correct microphones for your courtroom, but it is helpful to have a general idea of the factors involved.

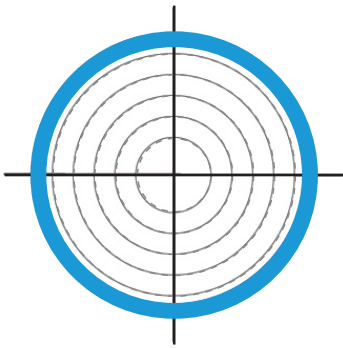
Focusing the Microphone

The microphone should be able to focus on the specific sounds that you want to record based on where the microphone is located physically in the courtroom as well as the polar pattern of the microphone. **Polar patterns** are the directions in which a microphone is most sensitive to sounds, as depicted below. This is important, because sound waves are constantly reflecting off courtroom surfaces and reach the microphone at different times, which makes the sound waves “out of phase,” and thus makes a less clear sound for the microphone to collect.

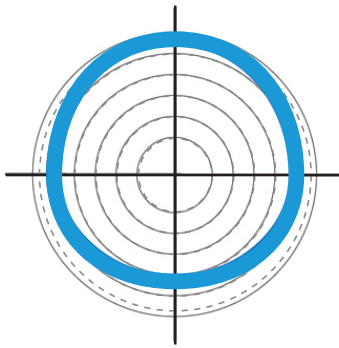
An omnidirectional microphone receives sound from all directions, while a bi-directional (or “Figure 8”) microphone picks up from the front and rear while rejecting sounds from the sides. A sub-cardioid microphone at the Judge’s approach might be perfect to capture the voices of the attorneys as they speak at the Judge’s bench. Cardioid microphones

(so-called because of the heart shape) are frequently used for targeting a specific area, such as counsel's table on the side where the attorneys are seated with their clients. Most microphones are constructed for one polar pattern. However, the most versatile microphones can adjust polar patterns.

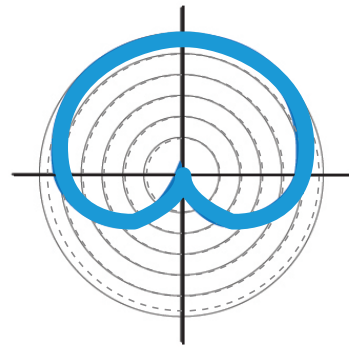
Omni-Directional



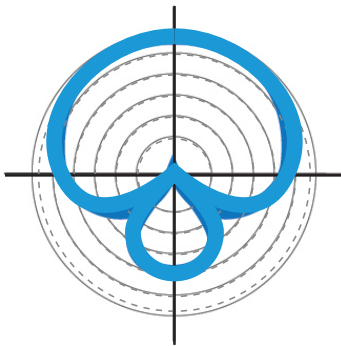
Sub-Cardioid



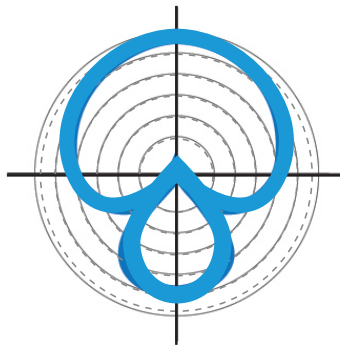
Cardioid



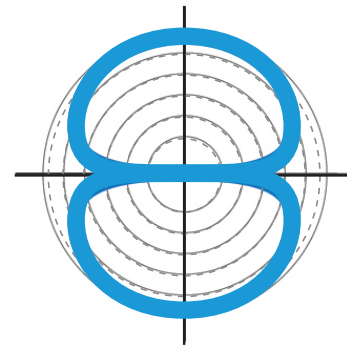
Super-Cardioid



Hyper-Cardioid



Bi-Directional

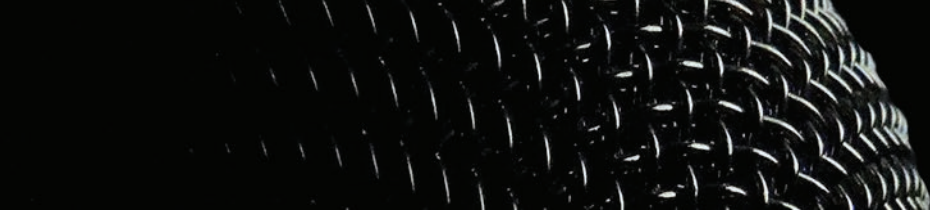


Recording Speakers Who Move Around the Courtroom

It can be a challenge to record attorneys who move around the courtroom at times, from counsel table to whiteboard to judge's bench to jury rail, for example. All microphones have at least one polar pattern that directs the areas of pick-up, so often a microphone with a broad pattern is desirable to capture the voices of attorneys who move around.

In addition, the physical shape of the microphone can affect its sensitivity to the direction of the source of sound. Wand microphones are thin, straight microphones that may be carried in the hand or placed on a stand, while gooseneck microphones have a long, flexible coupling, so the positioning of the microphone can be adjusted by each speaker at a podium. These are directional microphones that must be right in front of the speaker to efficiently pick up the voice, making them highly visible and not effective in picking up a wide range of the courtroom proceedings. Also, holding or moving a microphone while recording often introduces noise into the record.

Lapel microphones placed on an attorney's jacket might work for attorneys who move around the courtroom, but usually that means wires running along the courtroom floor from the microphone to the recording device. Wireless lapel microphones exist, but the expense and the need to remember to put them on and off each attorney at each appearance make them an unlikely choice.



One answer for effective courtroom microphones is to use boundary microphones, which are placed directly on a surface such as a wall or table. They give a clearer sound with fewer sound reflections and less interference than a microphone held or suspended in the air might have. Typically, being small and flat in shape, boundary microphones also tend to be less visibly obtrusive in courtrooms. Depending on the courtroom, multiple microphones will need to be placed throughout the area to be sure to pick up the entire record.

Switching to the Microphone Nearest the Person Speaking

In a courtroom, people are located in different places, from the bench to the witness stand to attorneys' tables. Obviously, the microphone physically closest to the speaker will pick up the voice in the best way, so that is the microphone that you want to be "live." However, it would be terribly awkward and inefficient to expect people to physically change which microphone is "on" each time a speaker changed.

Fortunately, there is software for the mixer that automatically switches which microphone is "live" based on when and where in the courtroom a speaker is speaking. The powerful software can control which microphone is "live" and adjust volume based on the sound level of the speaker.

In fact, the volume of most voices has to be amplified for a good recording. **Preamplifiers** (known as "preamps") are the devices which take low-level signals and amplify them. Preamps are usually found in the devices called **mixers**, devices which can take several signals and combine them into one sound recording. Good preamps can be costly. Fortunately, microphones now exist that have the preamp built in, so you only pay for the exact number of preamps that you need.

Easy Way to Know that the Microphone is Recording

It is important that it be immediately visible to everyone in the courtroom if a microphone is recording, turned off, or somehow malfunctioning. One effective way manufacturers do this is by making colored LED lights a part of the microphone housing. The lights can signal if – among other things—a microphone is on. According to Scott Sosebee, Assistant Court Administrator and Technology Manager of the Reno Justice Court, “Having LED lights incorporated [in the microphone] sounds small, but it was big for us, so judges know when it is recording.”³ With colored LED lights that can be customized to light up when recording (or when the microphone is actively muted), or to pulse red when there is a problem recording, everyone in the courtroom can see if the court record is functioning correctly.

CONCLUSION

Depending on its physical set-up, each courtroom has different acoustic needs. In general, courtroom microphones need broad pick-up coverage to capture speakers who may move around the courtroom. Microphone coverage depends on its physical location in relation to the speaker, its polar pattern, and the type and shape of the microphone. Microphone preamps have the ability to amplify signals depending on the strength of the speaker's voice. Software must be able to coordinate which microphones are live to capture the voice from the nearest microphone. Judges, court staff, and attorneys all need to be able to determine at a glance if a microphone is functioning correctly. A good courtroom audio or audio/video system can do all of these things.

About Justice AV Solutions (JAVS)

Justice AV Solutions (JAVS) is the global leader in digital courtroom recording solutions integrated in over 10,000 courtrooms throughout the United States and across four continents. Clients across the world have trusted the JAVS solution to accurately capture, store, and publish the official verbatim record of the court for 35 years. From public address to remote arraignment to open source access, JAVS promotes truth and accuracy by preserving the record for tomorrow's justice system.

Next Step

Call Justice AV Solutions (JAVS) at 1-800-354-JAVS or visit www.javs.com to schedule a consultation on the use of the FlexMic, our microphone designed specifically for courtrooms. The FlexMic is a boundary microphone that can switch polar patterns, adapting to the particular needs of your courtroom.

1. Author Julie A. Helling is a graduate of the University of Michigan Law School. She served as a prosecutor before becoming a college professor.
2. Glenn D. White, *The Audio Dictionary* (2nd edition), 260.
3. Phone interview of 12-20-2016 with Scott Sosebee, Assistant Court Administrator and Technology Manager, Reno Justice Court.