Microphone placements for various music instruments

Getting great live sound is the result of many factors. Not the least of these is mic placement. So if you're not playing arenas with a full sound crew well versed in these techniques, we can help with some useful tips and guidelines.

In this issue, we'll look at a typical rock line-up - guitar, keyboards, sax and drums. A good place to start is by listening to the sound of the instrument or the amplifier you are miking. How does the sound radiate? Listen up close, and then a few feet away. The closer a microphone is placed to the instrument (to maximize signal level and reduce pick-up of unwanted sounds), the more important placement becomes. Every instrument and microphone has its own characteristics. Every musician has his or her own idea of what sounds good. Experiment and listen.

General Rules for Placement

A major difference between miking for live sound versus recording is proximity to the sound source. The goal in live sound is to get the mic as close as possible to the source for two reasons:

1. Placing microphones as close as possible achieves maximum sound level before feedback occurs.

2. Close-miking reduces leakage and pick-up of unwanted sources.

1. Various types of Microphone placement for Acoustic guitar

Sound

Click on the Sound description for diagram

- Bassy
- Very Bassy
- Woody, warm, mellow
- Natural, well-balanced, slightly bright
- Natural, well-balanced
- Bassy, less string noise

Shure Mic:
PG81, SM57 or SM81

Placement:
Eight inches from sound hole

Comments:
Good starting position when leakage or feedback is a problem

Sound

Click on the Sound description for diagram

- Bassy
- Very Bassy
- Woody, warm, mellow
- Natural, well-balanced, slightly bright
- Natural, well-balanced
- Bassy, less string noise

Shure Mic:
PG81, SM57 or SM81

Placement:
Four to eight inches from bridge

Comments:
Reduces pickup and string noise

Sound

Click on the Sound description for diagram

- Bassy
- Very Bassy
- Woody, warm, mellow
- Natural, well-balanced, slightly bright
- Natural, well-balanced
- Bassy, less string noise

Shure Mic:
PG81, SM57 or SM81

Placement:
Three inches from sound hole

Comments:
Very good isolation

Sound

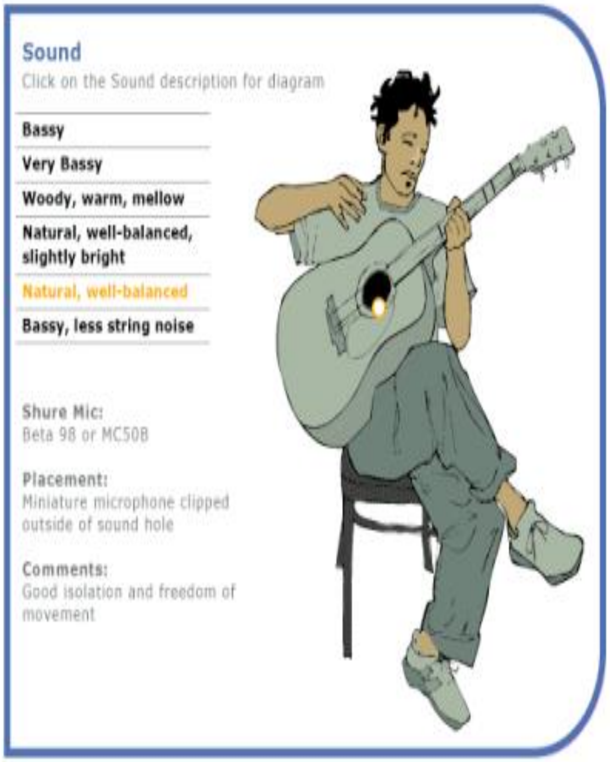
Click on the Sound description for diagram

- Bassy
- Very Bassy
- Woody, warm, mellow
- Natural, well-balanced, slightly bright
- Natural, well-balanced
- Bassy, less string noise

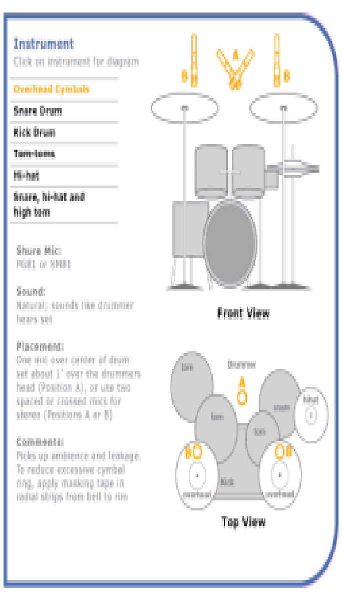
Shure Mic:
PG81, SM57 or SM81

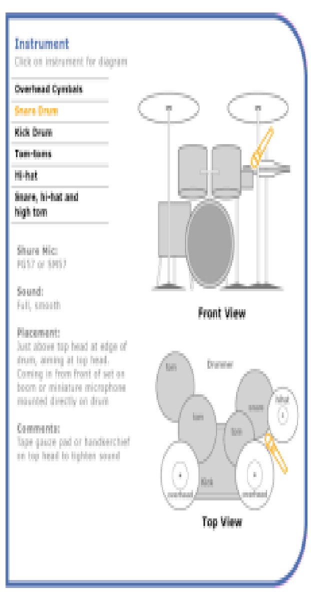
Placement:
6" above the top of guitar, over the bridge and even with the front soundboard

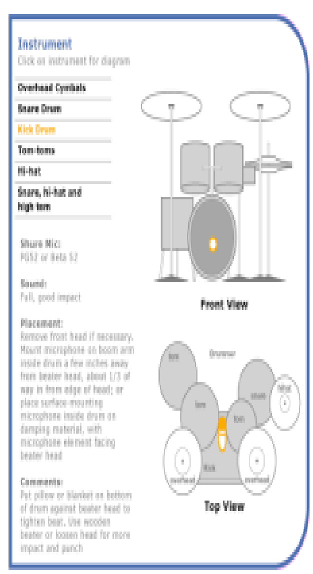
Comments:
Less pickup of ambient sound and leakage

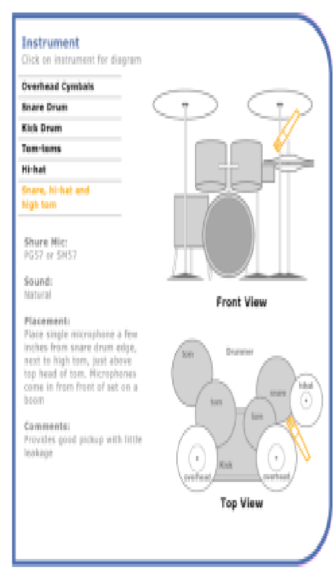


2. Various types of Microphone placement for drum kit (Percussion Instruments)









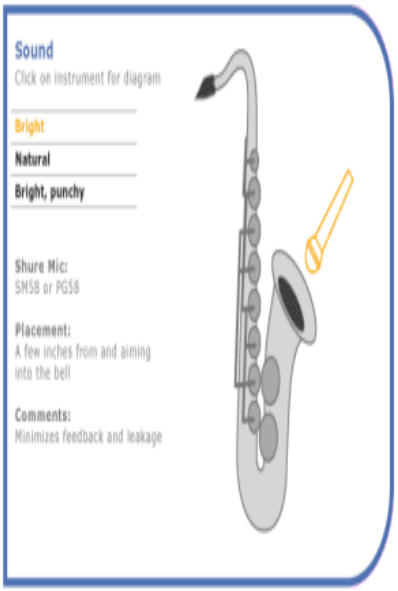
Drum Kit

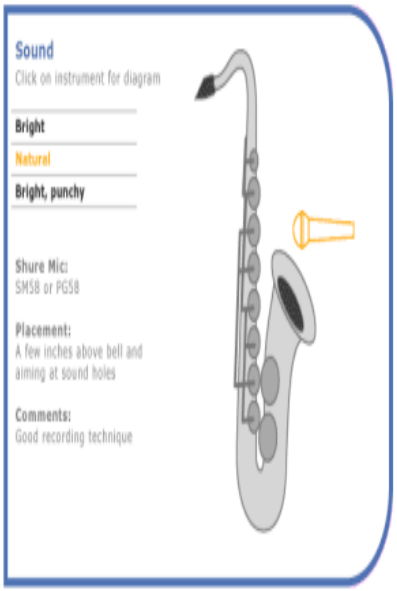
In most live sound systems, the drum set is miked with each drum having its own mic. Using microphones with tight polar patterns on toms helps to isolate the sound from each drum. It's possible to share one mic with two toms, but then, a microphone with a wider polar pattern should be used. The snare requires a mic that can handle a very high SPL (sound pressure level) so a dynamic mic is usually the choice. To avoid picking up the hi-hat in the snare mic, aim the null of the snare mic toward the hi-hat. The brilliance and high frequencies of cymbals are picked up best by a flat-response condenser mic.

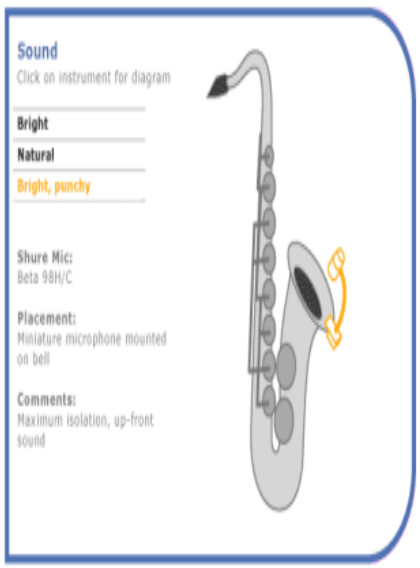
Saxophone

Like the electric guitar, the sax has sound characteristics similar to the human voice. And that's why the shaped response of a dynamic microphone is generally preferred. However, a miniature condenser microphone mounted on the bell often does the trick. The sound is fairly well distributed between the finger holes and the bell. Miking close to the finger holes produces key noises, so generally mics are placed toward the middle of the instrument. (Note: this technique does not apply to the soprano sax, since its bell does not curve upward - therefore, miking in the middle of the instrument won't pick up sounds from both the key holes and the bell.)

3. Various types of Microphone placement for Saxophone







CORDLESS MICROPHONE

A wireless microphone that is connected to a high-power transmitter in a fixed location. The transmitted voice is picked up by an FM receiver and heard through a speaker or headset .In a wireless microphone system, the components are miniaturized but the same principles apply. The transmitter is small enough to fit into the microphone handle or into a small pocket-sized case. Since the microphone and transmitter are battery powered, the user is free to move around while speaking or singing into the mic. The transmitted voice is picked up by a receiver that is wired to a speaker.

1. Handled cordless microphone

2. Lavaliere microphone or lapel mic

Two types of microphones are available with wireless mic systems: **Handheld mic,** with a transmitter in its handle and another **lavaliere mic or collar mic** which is small enough to be concealed as a lapel pin or hung around the neck. Lavaliere mics are wired to miniature body-pack transmitters, which fit into a pocket or clip onto a belt.

Wireless Microphones Transmitters Handheld wireless microphones (Fig1) have conventional microphone elements mounted to a handle into which a miniature radio transmitter and mic preamp are built. Several very good vocal performance microphones elements (and a lot more mediocre ones) are available on wireless transmitters from at least a dozen manufacturers

Lavaliere microphones (Fig 2) are also known as *lav*, *lapel* or *lap* microphones. A lavaliere mic is a very small condenser mic designed to pick up speech from a single person. Lavaliere mics are usually attached to the subject's clothing with a specific clip. Obviously the preferred position is on the lapel or thereabouts. This provides consistent close-range sound pickup and is ideal for interview situations in which each participant has their own mic.

Usage of Cordless microphone

Wireless microphones are widely used today in television and video Production. They eliminate the need for stage personnel to feed cables around cameras, props, etc. For location film production, as well as **ENG** (Electronic News Gathering) and **EFP** (Electronic Field Production)

Contact microphone

A contact microphone functions differently than dynamic, ribbon, and condenser microphones. Though they do function similarly to the microphones mentioned above in that they convert sound pressure waves into electrical energy. Contact mics pick up vibrations from the surface that they are placed on. They then convert the vibrations into a voltage that is passed into an appropriate preamp to boost the signal so that it is at a volume level that is suitable for recording. It is important to use a preamp designed for use with a contact microphone to attain the full frequency spectrum capable of the device

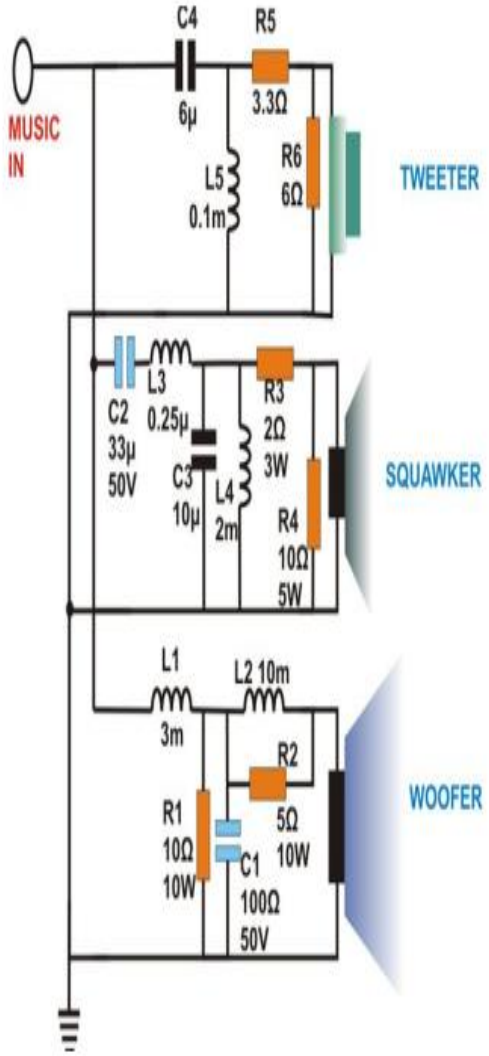
Speakers

A loudspeaker is simply a device that converts electrical energy into sound that is amplified so that it can be heard from a greater distance than the original sound would allow. There is no difference in usage of the terms *speaker* and *loudspeaker* and both are often used interchangeably. Some loudspeakers are capable of producing sounds over a wide range of frequencies and some are only made to reproduce certain frequencies.

There are three common type of Speakers

1. **Woofer – sub woofer** **(Re-produce the low and very low frequency)**
2. **Squawker** **(Re-produce the low mid and mid frequency)**
3. **Tweeter** **(Re-produce the high and very high frequency**

A three-way speaker circuit



Three-way speaker

A three-way speaker system can give a fuller range of sound compared to a two-way system. In a two-way system, the bass ranges go to the woofer, and the treble goes to the tweeter. Three-way speakers include a midrange driver that allows the frequencies between bass and treble to be heard more clearly than without the midrange driver. Since three-way speakers have more drivers than a two-way, they are larger and commonly found as floor models. One of the benefits of using floor, or tower, speakers is that they provide big, room-filling sound.