

AFFORDABLE MICS FOR YOUR HOME STUDIO

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No doubt about it: if you have a home studio, you need one or more good microphones. With them you can record or sample vocals, acoustic drums, acoustic guitar, electric guitar, piano, sax, and so on.

Over the last few years, the number of affordable mics for home and project studios has grown enormously. While it's great to have so many choices, it is also confusing. Out of the many models available, what are some low-cost mics that provide good value for home recording?

This article will provide some answers. First we need to briefly review microphone specs. Then we'll list the main microphone types for home recording, and finally we'll give example models of each type.

Make sure that your dealer has a return policy so you can return the microphone if it's not to your taste.

SPECS: WHAT TO LOOK FOR

One important specification is **frequency response**. This is the range of frequencies that the microphone can reproduce, within a tolerance (such as +/- 3 dB). For example, 50 Hz to 15 kHz +/- 2 dB. Generally the wider the frequency range, and the smaller the dB range, the more accurate and natural the mic sounds. A rise of a few dB above, say, 5 kHz is also acceptable because it provides a crisp sound with presence. For most instruments, a response from 80 Hz to 15 kHz or 20 kHz is adequate. Instruments with deep bass (acoustic bass, kick drum and piano) require a response down to 40 Hz or so.

Figure 1 below shows a frequency-response curve of a microphone: its relative output in dB versus frequency. The solid curve is the frequency response for sounds arriving in front of the microphone from 2 feet away. The dashed line is the response for sounds at the rear of the mic (at 180 degrees).

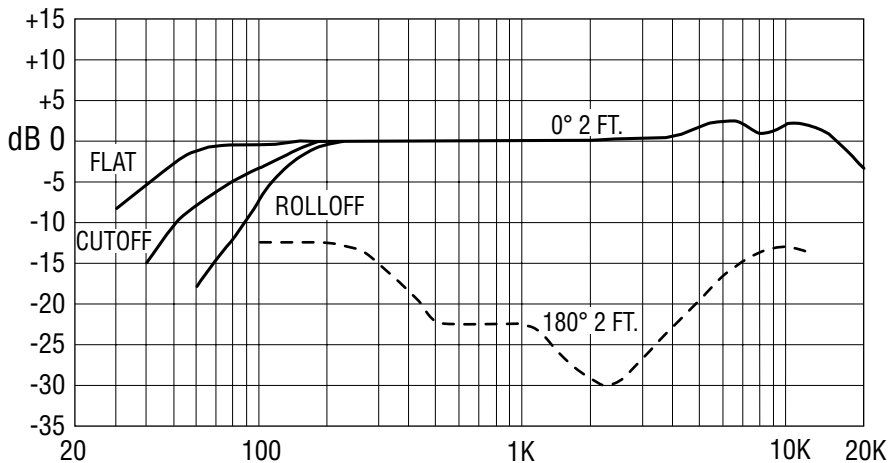


Figure 1. Example of the frequency response of a microphone.

The microphone should have low **self-noise** (inaudible hiss). A self-noise spec around 20 dB A-weighted is good, and 14 dB A-weighted or less is excellent. The microphone should be able to handle up to 135 dB SPL (sound pressure level) with no more than 3% total harmonic distortion. A **maximum SPL** spec of 120 dB SPL is good, 140 dB is very good, and 150 dB is excellent.

SUGGESTED MIC TYPES

Stick-type cardioid condenser mic

For miking cymbals and acoustic instruments, get a small-diaphragm, cardioid or supercardioid condenser microphone with a flat frequency response. This is a stick-shaped microphone, usually end-addressed, with a diaphragm under 1 inch in diameter (Figure 2, bottom).

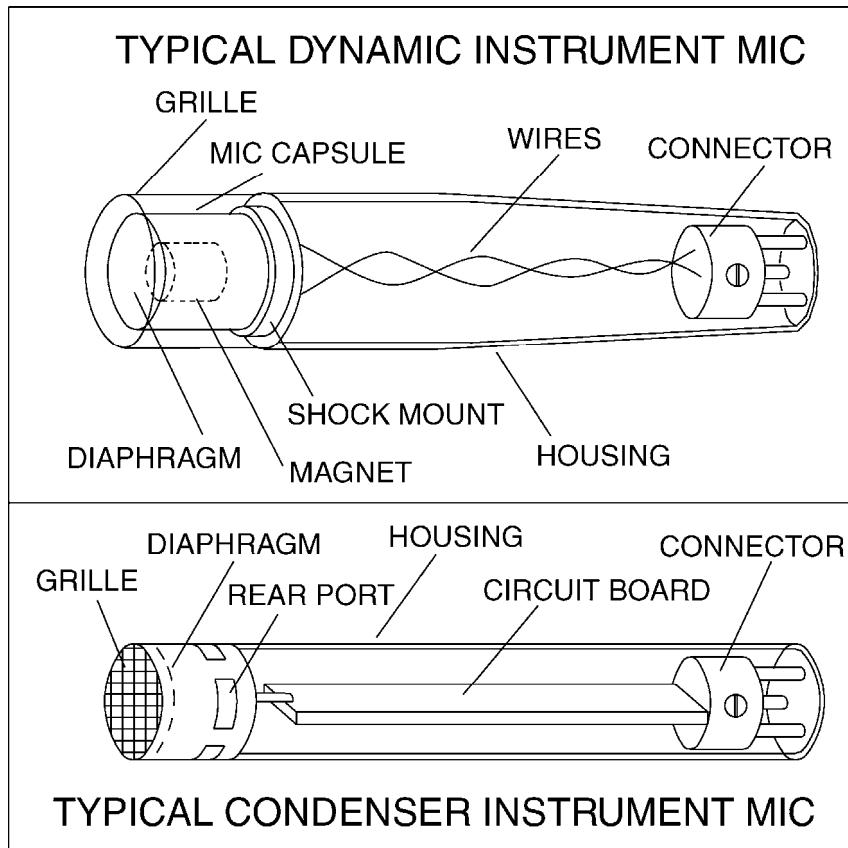


Figure 2. Cutaway view of a cardioid dynamic mic (top) and a cardioid condenser mic (bottom).

Let's explain the tech terms. Briefly, a **cardioid** microphone rejects sound from the rear and reduces pickup of room reverberation. It helps reject sounds from instruments you don't want to pick up. A **condenser** microphone uses a lightweight diaphragm charged with static electricity. When sound waves vibrate the diaphragm, the microphone generates a signal. A condenser mic generally gives a clear, detailed sound. It needs a power supply to operate, such as a battery or phantom power supply. Many mixers have phantom power built in. A flat frequency response indicates that the microphone reproduces the tone quality of the voice or instrument with high fidelity.

Some examples of low-cost condenser mics for instruments are: Crown CM-700 (Figure 3) and AKG Perception 170.



Figure 3. Crown CM-700, an example of a small-diaphragm cardioid condenser mic.

Dynamic instrument mic

For miking drums and guitar amps, this is the top choice. It is a stick-shaped dynamic microphone (Figure 2, top), end-addressed, with a cardioid or supercardioid pickup pattern and a presence peak in the frequency response. Briefly, the cardioid type rejects sound from the rear for good isolation. The dynamic type has a coil of wire and a magnet to generate a signal, and handles high sound levels. The presence peak is a rise in the frequency response in the upper midrange which adds crispness, clarity, and punch. Examples: AKG D 22/XLR.

You can mike a drum set with the two types just mentioned. A typical setup uses two cardioid condensers for the cymbals overhead, a cardioid dynamic on the kick and snare, and sometimes a cardioid dynamic on each tom.

Large-diaphragm condenser vocal mic

Nearly all studios use a large-diaphragm, side-addressed cardioid condenser mic to pick up vocals (Figure 4). This type of microphone sounds big and full. It has a diaphragm of one inch diameter or larger, and generally has very good low-frequency response and low self-noise. Common uses are studio vocals and acoustic instruments.



Figure 4. A large-diaphragm cardioid condenser mic with a pop filter and shock mount.

Examples: AKG C2000B, C3000B, C 214, Perception 100 and 200, and C 414 (Figure 5)



Figure 5. AKG C 414, an example of a large diaphragm condenser microphone.

In condenser mics, the electronics can be either a vacuum tube or an FET (Field Effect Transistor). Both sound about the same when picking up moderate sound levels. But with loud sounds, a tube starts to distort slightly in a pleasing way. This gives the tube mic a “warm” or “soft focus” sound that many engineers prefer. Tube mics, however, tend to cost more than transistor (solid state) mics. Examples: AKG C12 VR.

OTHER TYPES OF MICS

Another useful type of microphone is the **boundary microphone**. It's meant to be used on surfaces such as floors, walls, piano lids, or panels. It sounds great for piano and room ambience, but can be used in many other applications. Examples: Crown PZM 185, PZM-6D and PZM-30D (Figure 6).

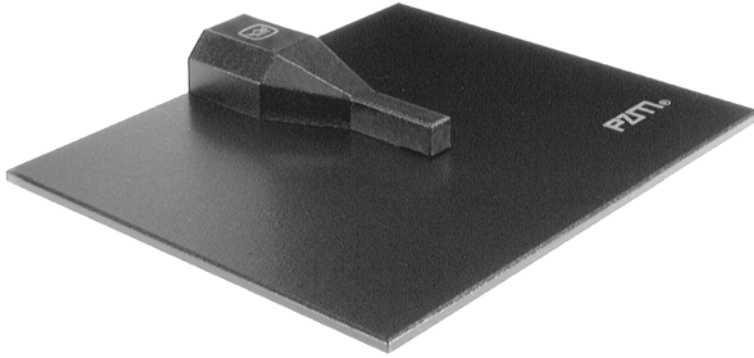


Figure 6. Crown PZM-30D, an example of a boundary microphone.

A **miniature condenser mic** is similar to what the TV newscasters wear. It clips onto an acoustic guitar, banjo, violin, sax, drum rim, flute, horn, etc. Sound quality is excellent and the price is relatively low. Examples: Crown GLM-100 (Figure 7), AKG Micro Mic Series.



Figure 7. Crown GLM-100, an example of a miniature omni condenser mic.

A **stereo microphone** mounts two mic capsules in a single housing for convenient stereo recording. Place one near a drum set, a grand piano, vibes, harmony singers, and so on. It also works great for a symphonic band or orchestra. Examples: Crown SASS-P MKII (Figure 8).



Figure 8. Crown SASS-P MKII, an example of a stereo microphone.

MIC ACCESSORIES

The following accessories are helpful for mounting microphones or for reducing their noise pickup:

- Mic stand with a baby boom
- Clip-on mic mount (such as made by Mic-Eze at www.ac-cetera.com)
- Shock mount: isolates the mic from stand and floor thumps.
- Pop filter: prevents breath pops from the letters p and b. Hoop or disk pop filters work much better than foam windscreens.

Microphone manufacturers are happy to send you free catalogs and application notes, suggesting which microphones might be good for home recording. Your dealers may have this literature, or you can get the information from the Web.

Remember, you can use any microphone on any instrument or vocal if it sounds good to you. Just try it and see if you like it.

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