

PRO AUDIO & RECORDING BUYER'S GUIDE & FAQs

What are things to consider when buying pro audio or recording gear?

Factors to consider include, but aren't limited to:

- Familiarity with Basic Terminology
- Intended Use
- Microphone Selection & Polar Patterns
- Computer Requirements
- Experience

Terminology & Recording Jargon

What's the difference between inputs, preamps, tracks, channels, etc.?

- **Input:** The physical location of where a device (e.g. recording interface) receives audio. The number of signals that can be recorded simultaneously is limited by the number of inputs.
- **Preamp:** An amplifier used to bring a microphone's signal to line-level. Sometimes erroneously referred to as a "Gain knob." A preamp is needed for each mic with which you intend to record.
- **Track:** Destination to which audio is recorded. The number of recorded signals that can be played back simultaneously is limited by the number of tracks on a given media.
- **Channel:** A single path that an audio signal can travel through from an input to an output.
- **MIDI:** Musical Instrument Digital Interface. A means through which to transfer information relating to digital instruments and their parameters. Commonly used for keyboards, digital drums, and transport controls (Play, Stop, Pause, etc.). No audio signal travels through MIDI, just information that eventually triggers audio or other information.
- **I/O:** Inputs/Outputs. May reference physical or virtual ins & outs (as in software routing).

Note that there are many other important terms to know when learning the art of recording. Don't get overwhelmed by the intense jargon! There's plenty of additional information available online relating to terminology, recording techniques, mixing theory, etc. Recording has many applications, styles, and methods, but remember that at the end of the day it's all about the music!

Intended Use

I know what I want to do, now what gear do I need?

Perhaps the most important thing to consider when buying any professional audio or recording gear is your intended use. What do you want to do? Common answers might include:

- Record a whole band
- Record only vocals, guitar, or another single audio source
- Field Recording (on location)
- Transfer media, e.g. convert your vinyl collection into digital audio

After you've decided what your end use is, you can begin narrowing down your options from the mountains of gear that's on the market. Most recording products have multiple applications, but some are better suited to more specific needs. For example, if you wanted to record nature and forest sounds, you *could* take a laptop, microphone, and an external interface rig (such as a Pro Tools setup) into the wilderness to record, but a portable recorder (like a Zoom H4) would probably be better suited to this application because of its portability and compact size.

Consider the fact that if you're going to be recording multiple sound sources at one time, like a band, you'll need at least one of the following for each sound source*:

- Tracks
- Inputs
- Preamps
- Microphones

*Note that some instruments, like drums, are usually mic'd with multiple-mic setups, and would require a respective amount of the components listed above. If you're a vocalist or guitarist that just wants to record yourself, also remember that you can "overdub," or record multiple tracks of yourself, with just a few of the above-mentioned items.

All recording equipment and computer interfaces have a limit on how many sources you can record at one time, and while many have the option of adding inputs, most offer 2-8 simultaneous inputs out-of-box. For example, the popular Digidesign Mbox 2 advertises 4 inputs because it has the potential to record 4 simultaneous sources *if* you have additional gear. As purchased out-of-box, it offers 2 simultaneous inputs, with 2 on-board preamps. The other 2 inputs would come via a S/PDIF

digital input, which carries 2 channels of digital audio from another preamp component with a S/PDIF digital output.

It can seem overwhelming, but just remember these general guidelines:

- Every sound source needs at least 1 microphone for discrete recording applications.
- Every mic needs a preamp.
- If a product lists x amount of inputs, you'll need x amount of preamps to take full advantage of its advertised potential. If it lists 4 inputs, but only has 2 preamps, assume you'll be limited to 2 simultaneous sources of audio, unless you have additional gear.
- Field recording is most easily done using a stereo-mic on a portable recorder, as opposed to a multiple-mic setup with a computer.

Why do I need an interface to record to my computer?

Computer interfaces serve 3 main purposes:

- Converting audio into a digital signal, and back to audio (A/D, D/A conversion).
- Amplifying mics' signals to line-level and supplying Phantom Power.
- Providing I/O for XLR, 1/4", and/or 1/8" connectors.

Interfaces usually connect to a computer via USB or Firewire. There are also USB mics that do not require an interface, because they have an A/D converter, preamp, and phantom power built into the mic itself, and plug directly into a USB port.

Note that some software, like Pro Tools M-Powered, requires use of a compatible interface in order for the software to function. You won't even be able to start the program unless you have a compatible M-Audio interface connected to your computer. Other programs, like Cubase, will work with virtually any interface or USB mic.

What do I need to transfer my old records, tapes, and 8 tracks onto my computer?

There are many products available that easily interface between older generation media players (record, tape, 8 track) and a computer. The most common method is through a converter that receives audio via RCA (the familiar White and Red cables) and transfers the audio into your computer via USB. An example of a product available through Austin Bazaar is the Gemini iConnex USB Audio Capture Device, which is quite compact and easy to use.

Microphone Selection

How do I know which mics to choose, and what's Phantom Power?

Microphone selection is a matter of two main considerations: application and 'color' of sound capture desired.

The two most common types of microphone are dynamic and condenser. A dynamic mic uses a voice coil and magnet to convert audio into an electric current. Common uses include stage vocal mics, drum mics, and amplifier mics. They can withstand higher SPLs (volume in dB) and are usually more durable physically than condenser mics.

Condenser mics use a thin metal element through which a 48v constant charge known as Phantom Power is passed. Phantom Power is required for a condenser mic to function. This constant charge makes condensers generally more sensitive than dynamics, and they're typically considered to have a 'clean' or 'pristine' sound. Common uses include studio vocals, acoustic guitar, piano, strings, and overhead mics. They are more susceptible to physical damage from abrupt jarring, and cannot withstand higher SPLs like dynamics. Putting a condenser mic in close proximity to a high SPL sound source, such as a snare drum, could damage or completely ruin the mic.

There are other types of less-commonly used mics as well, such as ribbon, stereo, and piezo mics. None of these classifications of mics are 'better' per se, but some applications are better suited to one type over the other.

All microphones have a unique sound that 'colors' the quality of the audio it's capturing. The sound of a mic is largely a matter of opinion, so the best way to choose which mic you want is to personally listen to a variety of sound samples through different mics. Most mics have demos available on the internet. Note that other elements in a signal chain, such as preamps, also affect the characteristics of microphones.

Here are some commonly used mics (available through Austin Bazaar) and their applications:

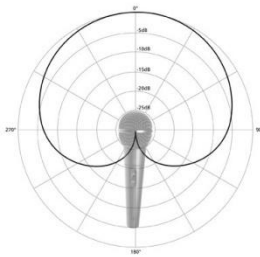
- **SM57** – Dynamic – Commonly used on Snare Drum, Toms, Electric Guitar & Keyboard Amps, Vocals, and Brass. It's a very versatile mic. Its counterpart, the **Beta 57**, has a tighter polar pattern and different frequency response for improved high-midrange clarity.
- **SM58** – Dynamic – Widely considered the most common stage vocal mic on the market. Its counterpart, the **Beta 58**, has a tighter polar pattern and a different frequency response for improved high-midrange clarity.
- **MXL V67G** – Condenser – Commonly used on vocals, acoustic guitar, and low- to mid-level SPL sound sources. Has a crisp clean sound, without sounding 'brittle' like some similarly-priced condensers. A great starter 'studio' mic.

- **MXL V88** – Condenser – The larger element makes it slightly warmer, and great for use on vocals, drum overheads, piano, or strings. Exceptionally priced; a good quality condenser.

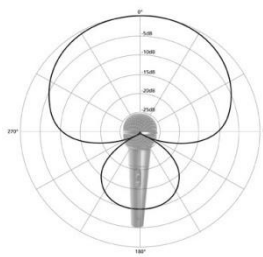
Polar Patterns

What does cardioid, figure 8, and omni refer to when describing mics?

Depending on their design and construction, microphones respond to sound coming from different directions with varying degrees of sensitivity. A plot or graph of this response is called a polar pattern (sometimes polar response curve). Looking at a mic's polar pattern will tell you how directional it is, and how well it will reject sound from certain directions. Here are some common polar patterns:



CARDIOD



SUPERCARDIOD

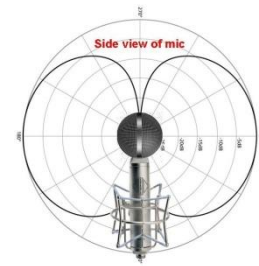


FIGURE 8

Omnidirectional or Omni mics theoretically have no rejection, and pick up sound from all directions. The diagram would look like one of the above, with the dark black lines removed. Mics with a Figure 8 pattern have dual elements aimed away from each other. When used creatively, one Figure 8 mic can mimic two cardioid mics. A common example of this is an M/S or “Middle Side” stereo mic technique, in which a Figure 8 is used in conjunction with a cardioid mic to receive sound from 3 directions simultaneously.

What’s the point of rejecting sound from a mic?

Selecting a mic based on its polar pattern is a great place to start when you’re considering the application of the mic. For example, if you were mic’ing a guitar amp but wanted to eliminate the ambient room noise (other instruments), you might choose a cardioid mic. Cardioids are also commonly used on stage when monitors are directly in front of a microphone. If a singer has dual monitors placed at 45° on either side of the mic, a supercardioid might be preferable. The purpose of this is to eliminate feedback.

Computer Requirements

How do I know if a product will work with my computer?

The best suggestion for a first-time recording software shopper is “Do your homework!” Most software retailers will NOT accept returns for opened software due to the spread of piracy. Check the system requirements listed for any piece of software or hardware (like an interface) that you intend to buy. Compare those requirements against your computers operating system and hardware. Here are the steps to check your computer’s specifications:

On a PC: Click the start button > Control Panel > System > General (tab)

On a Mac: Click the Apple logo (top left) > About This Mac

Nothing is more disappointing than getting excited about a new purchase, only to find out that it won’t run on your computer. If your computer doesn’t have the required specs, you can always look into upgrading whatever part of your system isn’t up to par for the software/hardware you want.

Experience

I’ve never recorded by myself before. Where do I start?

With the increased availability of affordable means of recording, more and more musicians have the option to record their music without the big-budget studios of the past. Many programs and hardware devices are catered to the home-user, and make learning the basics of recording technology easier.

If you’ve had any experience recording, whether in a studio or at home, use your experience to direct you towards your next move. If you know more about portable all-in-one multi-track recorders, consider that it may be easier to stick with what you know instead of learning software-based recording. If you’ve been in a session where an engineer was using Pro Tools, maybe you picked up more info than you thought by watching over their shoulder.

Most advanced programs have tutorial DVDs available for purchase, but also note that there’s plenty of information available online to give you the basics of recording techniques. Generally, the best way to learn pro audio and recording is hands-on experience.

