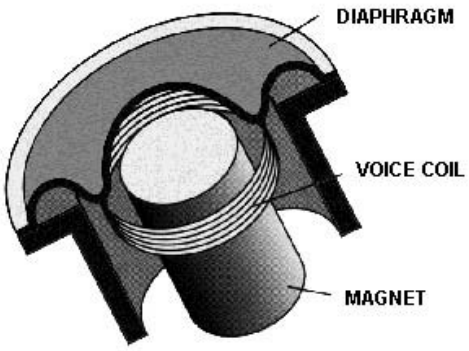
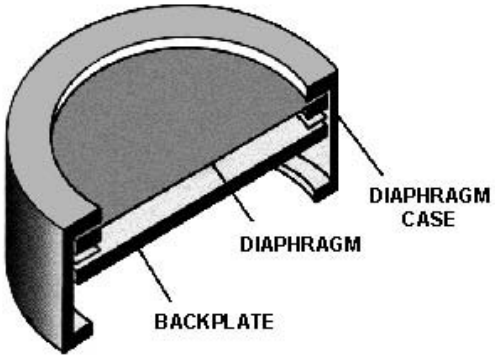
Let’s Record and Edit!

Microphone Types and How They Work

This is a bit technical, but might help you pick what to use on your own time. The InfoCommons Recording Studio has an AKG Perception condenser mic, which is perfect for recording vocals.

	
Dynamic Microphone: All Purpose (Sturdy) Sound waves hit the mic and vibrate the diaphragm, which is attached to the wire voice coil. The coil vibrates with the diaphragm, within the magnetic field created by the magnet. The motion of the coil in the field creates an electrical signal, which travels through the cable to whatever it’s plugged into. These vibrations are very small, so the signal needs to be amplified to be heard. Dynamic mics are sturdy, and good for severe environments, like noisy venues, or humid conditions. Since they have a quieter signal pickup, they can handle really loud noises (like drums), and don’t pick up too much background noise.	**Condenser Microphone:** Sensitive Diaphragm and backplate are metal, or metal-coated, and are electrified to create an electric field between them – this is a capacitor, historically called a condenser. Sound waves vibrate the diaphragm, changing its distance from the backplate, which creates an electrical signal from the changing size of the electrical field. Condenser mics need power supplied by battery or phantom power (power which is sent along the mic cable itself). Because of the power already supplied, they run “hotter” (louder, more sensitive) than dynamics. Condenser mics are good for picking up quieter nuances, as on intimate vocals or acoustic performance. They’ll pick up background noise too, and have a maximum noise threshold before they sound distorted. They’re also more susceptible to temperature and humidity.

How Sound Gets From Your Mic To Your Ears

Signal Flow: Path of audio signal from input to output (mic to speaker)

Mic/Line > PreAmp > Interface > Computer > Interface/Headphones/Speakers

Microphones perform transduction: converting acoustic sound to electrical signals. Mic diaphragm is attached to a coil of wire, which is near a magnet. When sound waves vibrate the diaphragm, the coil is moved around within the magnet's field. The vibrations in the magnetic field are sent from the microphone down the wire as an electric signal.

PreAmp boosts that signal. In the library, and almost any home studio, this is built into your audio interface, and controlled by the knob next to the mic plugin.

Interface then converts the analog signal from the mic into a digital signal for the computer. This is like the difference between a line drawn with a pencil vs. pixels.

Computer carries out your edits on the audio, and sends the signal out - basically the same process in reverse.

Interface converts the computer's signal from digital to analog, and sends that to…

Speakers/Headphones, which have a magnet and diaphragm of their own, which vibrate in the exact opposite way from your microphone. (*You can actually plug old earbuds into a mic input and use them as an incredibly basic microphone.)*

How to change the preferences for the microphone and interface:

Audacity:
http://manual.audacityteam.org/man/tutorial_audacity_settings_for_recording.html
Garage Band - https://support.apple.com/kb/PH24929?locale=en_US
Audition - https://helpx.adobe.com/audition/using/connecting-audio-hardware.html

Recording with the BPL's microphone

Input Gain: Avoid picking up too much background noise from outside of the booth

Gain is like sensitivity – it controls how much the pre-amp affects the incoming signal. There's a "noise floor" that comes with the signal. As you boost the gain, you also boost whatever noise (static) might accompany the signal. If your gain is up too high, you'll hear a hissing or buzzing from the microphone input, even with no audio. Go ahead and turn it down.

Ideally you won't have to crank your gain up to hear yourself. Good preamps have quieter noise floors, so they'll hiss less. But it's also important to get the right mic for the job. If you're recording something really quiet with a dynamic mic, and need lots of gain to hear it, try using a condenser mic instead. You won't need to turn the gain up so high.

Volume is affecting what comes out of a piece of gear, like a speaker. It's the end result. Gain is one of the ingredients.

Gain Staging: It's hardest to undo how something was recorded. Gain staging is the practice of trying to get the cleanest, loudest-but-not-too-loud signal you can from the beginning, so you don't have to turn things up or change them too much later on. (That can start to sound messy.) So, good gain staging lets you keep the purest audio possible, and gives you the most options later on to make and unmake edits. If your audio is fuzzy from the beginning, it'll take work to make it unfuzzy, and usually you can hear some artifacts from the process.

How to adjust or amplify the clip

Nearly every program has a way for you to adjust:

Track Volume – The volume of the track that is sent to the mixer.

Automation Lanes – Adjustments for individual elements, like Volume, Pan (left vs. right), Reverb, etc.

Mixer Sliders – The volume for a track, after its effects are applied.

Master Volume – The final end result of a mix, like turning a stereo knob.

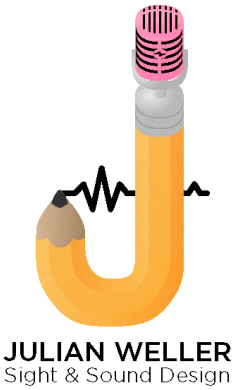
General Tips for Field/Video/Vocal Recording:

- **Headphones -** Studio monitors, not earbuds. Keep them on the whole time you're recording to hear p-pops, handling noise on the mic/grip, wind, etc. Sony MDR7506s are the standard ones you see everyone with.
- **Set levels -** So desired sound is coming in between -15 and -12dB. "Tickling 12," as Rob Byers calls it.
- **Mics -** Aim 'em just below the chin, to avoid plosives and mouth sounds. (Glasses of water help to get rid of those gummy mouth noises)
    - **General Condenser Mics –** Great for vocal work and acoustic instruments, if you don't need to worry too much about background environmental noise.

        - **Shotgun Mics -** super-directional condenser mics, great for sensitive directional sound in documentary videos, street interviews, field recordings, and tape syncs. Less good for crowded recordings with multiple mics and speakers, because they still pick up *some* noise from the sides, and bouncing off surfaces in the room.
        - I recommend the Rode NTG2 - industry standard, nice sound, compact. I use an AudioTechnica 897 - a little longer, has the option to use a AA battery, which lets you turn off phantom power and conserve field recorder battery.
    - **Dynamic Mics -** (classic vocal concert mic, like Shure SM58s) - Versatile and good for loud noises, screamo bands, basic multi-mic interview/discussion settings. They work well for those uses because they're directional, and don't pick up too much background noise. Shure SM58s are great for panel discussions, fine for basic podcasts, etc. You might notice they sound a little canned compared to real life. Here's a run down of some other common options.
        - For those of you doing professional voice over work with the option to spend a little more money: The *classic* radio mic is the Electrovoice RE20. They're so common you can see them in Frasier episodes. Sometimes radio people specifically request them for recording jobs. No need to break the bank for one though.
    - **Built-in Mics -** On a Zoom recorder, pretty good quality. In general, these are good for collecting ambient sound. Set the levels at the start and try not to touch them, so you don't risk making handling noise (You'll hear if you do, though, since you're wearing your headphones, right?). Built-in mic quality varies across brands, though. Transom.org has some good reviews.
- **Windscreens -** These are useful anywhere, and important if you're outdoors - foam ones for interviews, fluffy ones for outdoors. I keep my furry one on my shotgun mic always, because it's so sensitive to wind, even from a mouth.
- **Shock mounts - totally worth the money** for your condenser mic. You won't regret buying a shotgun grip for your shotgun mic, or a shockmount for the top of your camera. They kill handling noise, and are way more comfortable to hold for long interviews. Rode makes some great ones, but you can squeeze by on a budget too.

Need more detail? Check out this **Ear Training/Audio Producing Guide** by Rob Byers, NPR's patron saint of audio. Setting up to record at home? Jeff Towne over at Transom has you covered with his Podcasting Basics series. **Here's Part 1**.

I hope that's helpful!
All the best,



p.s. Useful Links:

julian.link/resources - A link to the email I send everyone I've taught to record and edit.

http://transom.org/ - Helpful studio set up advice, gear reviews, program walk throughs, podcasting basics, anything else you could want.

Transom's Podcasting Basics series - https://transom.org/tag/podcast-basics/

NPR's training guide for audio producers - http://training.npr.org/audio/the-ear-training-guide-for-audio-producers/

How to change the preferences for the microphone and interface:

Audacity: http://manual.audacityteam.org/man/tutorial_audacity_settings_for_recording.html
Garage Band: https://support.apple.com/kb/PH24929?locale=en_US
Audition: https://helpx.adobe.com/audition/using/connecting-audio-hardware.html

Common Dynamic mics - https://www.youtube.com/watch?v=XMiuElvxEFw