Quick Start Guide to the Audio Recording Studio at the Weitz

Intro

It's exceptionally quiet in the Audio Recording Studio at the Weitz and that is a very special thing--difficult to achieve elsewhere. Very little sound can get in and every surface is treated to control how the sound reflects off it. Quality audio represents sound clearly in a life-like way. It's as accurate as possible to the sound we experience with our ears. It's full and present, not thin or distant. We should hear the sound directly as it hits the mic, not its echo as it bounces around the room. This room makes it straightforward to do these things.

Booking Process

How does someone get into the Audio Recording Studio? By watching all of the orientation video, passing a quiz about it, and filling in a studio request form found at go.carleton.edu/studio.

When you fill in the form, please list your first, second, and third choices of dates and times. By turning in the studio request form, you agree to be responsible for the space and its equipment and to follow safety rules set forth here and posted in studio.

The Production Office reviews requests during business hours during the week. We'll confirm one of your times, or work with you by Carleton email to find another, and set your OneCard to open the door during the exact times of your reservation. We won't book studio reservations less than an hour apart. That's not an hour extra for the outgoing booking, that's an hour for building ventilation to do its thing, so it's important to leave on time.

COVID Safety

We know these things are important: wear a mask so it covers mouth and nose completely. Maintain six feet distance between other people. How does that work out in such close quarters as the Audio Recording Studio?

For the rest of this term, I've set up two studio mics on the soundstage, one on each dot. Please leave them right there--I hope you get the chance to learn what a versatile setup this is. The cables should run smoothly along the floor to the wall and from there to the patch panel, a metal plate with lots of plugs in it that leads to the control room. Notice how easily you could swing one mic over to the practice amp and the other over to the piano.

Can there be two people on the the soundstage? Yes, but they have to stay on the dots and wear masks the whole time--that might be limited to making sound effects or playing a non-wind instrument, for instance.

The thinking is that there's one person on the soundstage at a time with mask on. They may, if they choose, lower their mask to speak, sing, or play a wind instrument right before a recording take begins, but they need to mask up again as soon as the take is over.

Only one person can be in the control room at a time. If someone on the soundstage wants to hear a take, there's a simple way to playback on the soundstage speakers. If you're in the control room, working with someone on the soundstage, please keep wearing a mask the whole time.

If you're alone in the *entire* studio--soundstage and control room--if you choose, you may work without a mask, as though it were a private office. That doesn't happen very often, though, because this is largely collaborative work.

There's no way to clean a mic without running the risk of liquid getting inside. If a piece of equipment can't be cleaned, it must be quarantined for 72 hours, and that would play havoc with circulation, so please don't touch the mics.

There is a way to adjust a mic on a stand without touching the mic. At the base of the mic there's knob that adjusts what angle the mic is at. It's just fine to loosen that, adjust it by holding the base of the mic cable (not the mic), and tighten the knob, then wipe it down when you're done. Mic height is easily adjusted by holding the upper tube of the main column of the mic stand, then loosening the collar (it's at about waist height), then raising or lowering the upper tube, and retightening the collar.

If anyone's speaking, singing, or playing a wind instrument, clamp a pop filter to the mic stand so the filter's about six inches from the front of the mic. Most people's voices sound good standing about six inches from the pop filter. We'll talk about how that pop filter gets cleaned near the end of this video.

In the Studio

If something seems unsafe or unwise, don't do it. There's always more than one way to convey an effect. Stop what you're doing and discuss with your team how to do something more safely. No piece of audio is worth risking harm to achieve it.

There are lights overhead--please don't adjust them. I have them focussed on the copy stands, piano music holder, and headphone amp.

Make sure that, from the door to the place you need someone to sit or stand, there's a path to walk without having step over anything.

Speaking or singing for any length of time dries out the voice. You're welcome to bring water onto the soundstage as long as it's in a container that closes completely. Please don't bring any other food or drink onto the soundstage and no food or drink at all in the control room.

Bring a buddy.

Leave the place a little neater than you found it. Make sure to load out everything you brought in.

You're responsible for the studio and its equipment and your safety while you're here.

Signal Path

So how does this work? When a mic is plugged into a cable, and a cable into the patch panel on the soundstage, wires in the walls connect to the patch panel in the control room. Then some more cables connect to the audio interface, which turns the sound from analog to digital, and offers it to the computer for you to record in Audition and hear on the speakers in the control room. That is a complete signal path.

How to Set up a Session

1. Check mic cables are plugged in.
2. Turn on the audio interface.
3. Turn on the computer.
4. Turn on phantom power for channel 1–4 second-to-last.
5. Turn on the control speakers last.
6. Sign into the computer with your Carleton user name and password.
7. Launch Adobe Audition and sign in.
8. Go to the Preferences menu and choose Audio Hardware.
9. In the window that opens, set:
    a. Default input,
    b. Default output, and
    c. master clock all as our audio interface,
    d. Sample rate to 48000 Hz, and
    e. Latency to the lowest setting it will allow.
10. Click on the File menu and choose File → New → Multitrack Session.
11. In the window that opens,
    a. give your session a name,
    b. browse to the Scratch Disc,
    c. choose a sample rate of 48000 Hz and
    d. bit depth of 24 bits, and
    e. choose stereo,

    then click OK.
12. Click on the Multitrack menu and choose Multitrack → Tracks → Delete Empty Tracks.
13. Now click Multitrack → Tracks → Add Mono Audio Track.

14. Look at the track you just made. Click on the rectangular box and rename the track. (Do these two steps again to create a second track if you're using both mics.)
15. Click on the box next to the arrow that points toward the right and choose Mono → [01M] Clarett 8Pre USB Input 1. (This is input 01 on the audio interface.) You just connected channel one on the audio interface to your track in Audition. (If you're using a second mic, repeat this with a a second track.)
16. On your track, click the rectangular boxes labelled "R" and "I". R arms the track to record and I lets you hear what you're recording.
17. Setting record levels
    a. Look on the front of the audio interface for the channel one knob. Start by turning it halfway up.
    b. Press the record button.
    c. Go to the soundstage and speak, sing, or play as you plan to for just a couple lines (or ask the person who's going to be out there to do so).
    d. Press stop.
    e. Rewind and listen. The goal is for the loudest moments of what you're recording to mostly fill the track, but leave a margin for error we call headroom. The loudest sounds should reach -12 dB without going over. What does this mean? We have this scale from -inf to 0 dB. -Inf means quiet and 0 dB means this track is holding all the audio it can accurately represent before it distorts, and there's no fixing distortion later.
    f. Repeat this, looking for the best level you can set. Allow yourself some patience--it's really okay if it takes several attempts to set good record levels. If you're recording the sound of someone speaking, you probably need more level than half on the channel one knob on the audio interface. (If you're recording something really loud you might need to turn it down to less than half. Preserve 12 dB headroom and you'll be just fine.)
18. monitoring

    So you've set a record level, now let's think about playback level. Who can hear what you're recording or playing back? There are three more knobs on the audio interface that send audio, one to each place: speakers in the control room, headphones on the soundstage, and speakers on the soundstage. Just a few points about each of these:
    a. Find a comfortable level for control room speakers and leave it there for your your session.
    b. If someone on the soundstage wants to hear themselves on headphones, turn up the knob labelled "headphone amp on the soundstage." A headphone gives more than one person the chance to each set their own

headphone volume. We leave one pair of headphones on the soundstage. They'll just need to turn on the headphone amp, set overall volume, and set the volume on their headphone channel. I like to start with all of these levels at half.

c. There are speakers on the soundstage, which are useful for social distancing to play back what you've just recorded for someone without you having to be in the same room. However: if you leave this on during recording, you'll create feedback, so please remember to turn this all the way back down whenever you're recording.

19. cuing

When you've got record levels set and it's time to start recording:

a. press the record button,
b. make sure Audition is recording,
c. count the person down: three, two, one, and point at them through the window.
d. Then they'll know to record their take.
e. If you think someone's done, keep recording for a little while longer just to make sure you're not accidentally cutting them off.
f. Always record room tone. With the mic set just as it is, at the record level you ended up on, record 60 seconds of silence. Very useful for editing.

20. file management

Let's say it's the end of your recording session.

a. Back up your files to two places: the cloud and physical storage device is a good idea. How? When you named your session, Audition automatically created a folder on the Scratch Drive. Unless you used Save As to save something elsewhere, everything you recorded today is in that folder. Drag and drop that folder into the cloud and onto your physical storage device. When you rename your tracks while setting up your session, it's fairly easy to make sense of all these files.
b. If you're working on a project you don't want anyone to hear, it's up to you to delete your files after you've confirmed you backed them up.
c. If your files happen to be here next time you come back, great, but Scratch Disc is not storage. The computer could need a total rebuild at any time.
d. Scratch Disc usually has plenty of space on it but, if you need to delete files to make room for your own, please delete the oldest files first.

21. Shut things down in the booth:

a. Turn off the speakers,

b. close Audition,
c. log out of the computer,
d. turn phantom power off, and
e. turn off the audio interface.

22. Reset on the soundstage:
    a. Please *don't* tear down mics and stands. Please leave mics connected to their cables and plugged into the patch panel. The less everyone has to touch the better, and the less set-up for the next person.
    b. If you swung a mic stand around to the piano or practice amp, please swing it back and leave each mic adjust for standing height. This is how most people are likely to use the studio.

23. Cleaning:
    a. Please don't try to clean a mic--it's far too easy for liquid to get inside.
    b. Take the pop filter off and hold it away from mics and electronics, spray it with the bottle of college-supplied cleaner, and put it in the bucket. The pop filter is the only thing it's okay to spray directly.
    c. Next, take a wipe and spray it with the bottle of college-supplied cleaner.
    d. Wipe down what you touched, including mic stand knobs, keyboard and mouse, audio interface knobs, door knobs, piano keys. Don't wipe it dry; leave the cleaner on the object's surface.

24. Take one last look around and make sure you didn't forget anything. That's a lot of detail, I know, but please do use this video as a resource during your sessions. I hope you get a chance to use this room!

Important terms

Digital audio is represented in bits. A bit is a place that can store either a zero or a one. Bit depth is how many bits are used to represent each sample. 24-bit is commonly used.

mic placement

Once inside a good facility with professional microphones, there's nothing more vital to the quality of your recording than where you decide to place each mic relative to the sound you want to capture with it. As engineer, it's your job to position each mic relative to the person or instrument and see that it stays there. This can mean asking a person to stand still, or providing them a straight-back chair to sit in, rather than one that

swivels. So vital is mic placement to good recordings that professional audio engineers ask producers, directors, voice actors, and musicians not to so much as touch a mic stand in the studio.

Phantom power is a little bit of electrical current that travels up the mic cable from the interface to the mic. It's enough that mics and speakers can be damaged if a mic is plugged in or unplugged while phantom power is turned on.

Turn phantom power on after you've made sure mics are plugged in but before you turn on speakers. At the end of your session, turn phantom power off after you turn off the speakers.

Sample rate is how many times per second the audio equipment "listens" to the electrical impulses coming from the mic and turns them digital. 48,000 samples per second (48,000 Hz, or 48 kHz) is commonly used.

Basic Mic Placement Recipes

Each of these is a templates to modify as you need, according to what you actually hear, but they're good starting points.

Speaking or Singing: Pop filter 6" from Shure KSM-32, person 6" from pop filter. A bit further away for singing.

Piano: one or two mics suspended directly over the resonating chamber with the lid open; The further inside the resonating chamber a mic goes, the more it picks up the action of the piano (its mechanical workings).

Electric Guitar: one mic positioned six inches from the amp, off to one side rather than in the center of where the speaker is; Start low, turning up gradually, and take care not to damage your hearing or any of the speakers. You don't have to fill the room with volume--also our little practice amp wouldn't sound particularly good if you did. If you're having trouble finding a mic level on the audio interface *low* enough, look at the back of the mic: there's a switch you can set to -15 dB. This is called attenuation and it makes the mic itself 15 dB less sensitive than it would be otherwise, which will help in this case. CAUTION: if you use the -15 dB setting, please be very sure to set it back to 0 dB when you're through, or the next person will be very confused.

Acoustic Guitar: one mic at the resonating chamber (the widest part of the body) and one at the place where the neck meets the body

Trumpet: mic about 20 degrees off-axis, and three feet in front, of the horn's bell

Further Resources

Adobe Audition Learn and Support:
https://helpx.adobe.com/support/audition.html

Focusrite Clarett 8Pre USB manual:
https://fael-downloads-prod.focusrite.com/customer/prod/s3fs-public/focusrite/downloads/32412/focusrite-control-clarett-preusbv1.0.pdf

Focusrite troubleshooting:
https://support.focusrite.com/hc/en-gb/requests/new

Shure Microphone Basics