Basic Recording Tutorial for Asynchronous and Hybrid Ensembles

By Chris Fitzgerald, August 2020

The jazz area will be offering at least two remote ensembles this Fall, and the uncertainty surrounding the Covid-19 situation could cause more restrictions on in-person ensemble rehearsals and performances later in the semester. We hope this doesn't happen, but it is also wise to be prepared.

This tutorial/guide is an attempt to cover a few of the basics needed to get started with successful and proven recording practices. Learning these basic concepts and skills will be essential for anyone taking part in an asynchronous recording project, but aside from that, learning to record your instrument well is also an essential skill in the current musical environment and should be encouraged for all musicians in general.

Note: hyperlinks to external videos and tutorials are included in this document. If they don't function as intended on your system, all links are included at the very end in a format that can be easily pasted into a browser window.

- **What is an asynchronous recording?**

- Simply put, it's a performance recording stitched together from individually recorded parts not recorded at the same time or in the same place. These can run the gamut from ensembles including thousands of individual parts to our own Cardinal marching band to smaller chamber groups like these trio and duo recordings from our jazz faculty.

- **How difficult are they to create?**

- The process of stitching a successful asynchronous recording together is somewhat but not prohibitively complicated, and can be accomplished on software as basic as Garage Band and iMovie, which come pre installed on modern Apple computers.
- As an example, here is a good short guide about how to assemble a virtual choir that could be applied to just about any instrumental ensemble. However, let's assume for now that you will have access to someone attached to the your area or the SoM staff to help you put the first project or two together. This will allow us to focus on the more practical matters of how to generate good parts to contribute to the project here.

- **Can the individual parts all be recorded on the performer's smartphone?**

- Yes, and this is a good way to get started. However, for better audio quality it's best to record audio and video separately. There are several reasons for this:
  1) One is that the best location to record audio from is much closer than the minimum distance required to record the best video quality.
  2) Another is that it's common practice to mix the audio parts together separately into a quality audio recording and then add the video at the end of the process.
  3) Last, since audio files are exponentially smaller than video files, the product workflow moves much more quickly if only audio files are sent to a central source early in the process. Audio file uploads take place in seconds, while video file uploads can take hours, depending on the connection speed and medium.

- **What do I need to record quality audio and video separately? Isn't that expensive?**
- It's not nearly as expensive as you might think. Most modern cell phone cameras are excellent and capable of high-resolution video capture. Beyond the camera itself, understanding how to light and frame the shot are paramount. Here are some good tips for improving smartphone video quality.
- **For audio, there are several ways to approach the issue:**
- One is to purchase an improved external microphone for your smartphone, like the Shure MV88+. While there are many excellent smartphone microphones that will improve audio quality, most don't solve the problem of being able to position the microphone closer to the instrument than the camera, and they also record directly to the video track. This means that the performer will then need to understand how their phone's recording software works to avoid built in compression and to learn how to export audio separately. For this reason, I don't recommend this method for beginners.
- **The recommended method for recording audio** is to use an external audio recorder, such as the Zoom H1n or the slightly more expensive Zoom H2n. For less than the cost of many textbooks, these devices allow the user to find the best location to record the instrument from, record their instrument using high quality microphones and preamps, and easily extract and transfer quality audio recordings to the project manager of the asynchronous recording. We'll explore some aspects of this way of working below.

- **Audio recording basics using a portable digital recorder:**

1) **Disable the Automatic Gain Control feature on your recorder**. Many recorders and cameras have a built in feature, often called Automatic Gain Control (AGC), that changes the level of the content recorded to make it as consistently as loud as possible. While this can be convenient for quick voice recordings where audio quality is not at a premium, it wreaks havoc with the dynamic content of anything you play, taking control of the level settings away from the performer. Once it is disabled, your dynamic range is back in your control, and all that is needed is to learn how to set the levels manually.
2) **Learn to set and monitor your recording levels manually.** Once you are sure your recorder's AGC is disabled, start playing and recording while watching the input level meter on your recorder. The scale of audio input is measured in decibels (dB). When your input level exceeds 0dB, distortion (aka "clipping") is introduced into your signal and the resulting recording is basically ruined because in the digital domain, clipping cannot be removed. For this reason, you'll want to set your level very carefully so that the loudest thing you play registers well below the distortion threshold. A good general guideline is for the loudest sound you will make to register at about -12dB on the input meter. This short video is an excellent introduction to this subject.
3) **Experiment to find the best distance and position to place the recorder when recording.** Since this is different for every instrument, there is no one right answer for everyone. But in general, up to a point, closer tends to be better to capture a strong signal from your instrument. This is because when the microphone is placed farther from the source, it tend to pick up more reflected noise from the walls and ceiling of the room you are in; unless you are making a solo recording in a concert hall, including lots of room sound in your recording is usually not a good idea. A good rule of thumb is to place your

recorder with the microphone capsules pointed toward your instrument anywhere from 12-18" away. Together with an optimal input level setting, this will ensure a good strong recording level and minimize unwanted room noise.

4) **How to make your recording space sound better.** Often, the rooms we have available to record in can be too reverberant, which dilutes the pure sound of our instruments. Fortunately, it's relatively simple to make a bad sounding space sound better for recording using items we probably all have access to. This short video offers some excellent suggestions for how to improve the sound of your space for recording purposes. Again, the key is to experiment and listen until you come up with a solution that sounds good.
5) **Use Audacity to normalize your recording (optional):** this step is optional, since you may want to leave all of the audio editing to the manager of your project. But if you're curious, the free recording software Audacity, available for Mac and PC, is a great tool to know how to use. The "Normalize" function takes the safe non-distorted recording you just made with your recorder and brings the levels up to a stronger level for playback. For those who want to send off the best audio file possible, this is a good step to take. This Audacity for Beginners video covers all the steps needed to get you up and running with basic audio editing with this free software.

With these few principles in place, and using only your phone and an inexpensive audio recorder, you should have all the tools you need to be able to create a solid contribution to an asynchronous recording project. As an added bonus, the skills you will learn along the way will also likely benefit you moving forward in many other ways, and help make you a more versatile and complete musician.

Links:

- **Asynchronous recording examples:**
  - Virtual 17,000 Voice Choir: https://www.youtube.com/watch?v=uS0ioMnVdHw
  - Cardinal Marching Band: https://www.youtube.com/watch?v=88KOvII_pQ8
  - Faculty Jazz Trio: https://www.youtube.com/watch?v=mncjUbupmug
  - Faculty Jazz Duo: https://www.youtube.com/watch?v=Qzp5ksEQ1AM
  - Short guide to basic virtual choir creation: https://www.youtube.com/watch?v=XuWgXGIByAw

- **Smartphone Video Recording Tips:** https://wave.video/blog/12-simple-tips-for-making-your-videos-look-more-professional/
- **Shure MV88+ Video Microphone Kit:** https://www.bhphotovideo.com/c/product/1451035-REG/shure_mv88_video_kit_digital.html
- **Zoom H1n Recorder:** https://www.bhphotovideo.com/c/product/1381744-REG/zoom_zh1n_h1n_handy_recorder.html
- **Zoom H2 Recorder:** https://www.bhphotovideo.com/c/product/811053-REG/Zoom_ZH2N_H2n_Handy_Recorder_Portable.html?sts=pi&pim=Y
- **How to Set Audio Recording Levels:** https://www.youtube.com/watch?v=UAb-hV2uBj4
- **Improve the Sound of Your Recording Space:** https://www.youtube.com/watch?v=SyMJlruhdQ4
- **Audacity for Beginners:** https://www.youtube.com/watch?v=aCisC3sHneM