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How to record a virtual choir performance

Follow these five steps to create the illusion of a collective performance by using separate recordings of individual singers

Before you start

In addition to the ensemble and the conductor, you need a **supervisor to record, mix and edit the audio and video**. This person should be equipped with

- basic knowledge of audio and video technology
- equipment and software (which is commonly used and available for students and schools)

Another important note:

Recording a real-time virtual choral performance with a large group of singers in separate locations is not yet possible with home-based technology. It does not work because of latency issues.

Step 1: Make a high-quality base track for choir

Start out by playing a supporting piano track with metronome click

- tempo and click: The Song of the Fearless has fixed tempo, however it is possible to build tempo maps for the metronome click with any common digital audio workstation (eg. Ableton Live, Logic, or Pro Tools)
- NB: when working with a piano, one operates in a tempered world. You can use, for example, the tonic of the songs key as a supporting tone if you want to strive for a more choral tone.

Sing demo parts on top of the supporting piano track to ensure consistent phrasing and articulation of the text

Add the click to the base track

- there are rests in the track and no visual contact with the choir conductor
- in our version, we also added opening notes and started the click two bars before the beginning to ensure a strong start

Remove the supporting piano track and mix the click lower

- the click should be mixed low enough not to cause headphone leakage to the actual recording

Send separate mixes to each voice group, with their own part mixed 6dB louder than the others

Step 2: Prepare very clear recording instructions for choir

These are the instructions we sent to our singers:

Base track

- Play the base track through headphones (do not use speakers!) and use only one earpiece to hear yourself too
- Don't play the base track too loud on your headphones to minimize the leakage to the microphone
- Sing the song from the beginning to the end a few times to get used to this kind of listening environment in terms of tuning and dynamics: aim for a slightly smoother dynamics than usual (try to stick to mezzoforte–forte terrain)

Before recording

- Record the video on your phone, tablet or laptop
- Do utilize home studio technology if available
- Choose a space that has dry acoustics and good lighting
- Make a test recording to be sure that the sound is not distorted and you don't have your finger in front of the microphone! Pay attention to hums and buzzes in your room (lights, ventilation, traffic noise, laptop hum...) and try to optimize wherever possible

About the recording

- Shoot the video in portrait mode!
- Focus on the face and your upper body, make sure there is not too much extra space above your head
- Play the base track through your headphones and record a video while singing on it

Sending the file

- Send your video file via WeTransfer (+ email address, deadline)

Step 3: Obtain and organize files

Organize the files you received into their own folders by naming each file with the singer's name and part to keep track of who has uploaded their videos. Color-code the parts and store possible b-roll videos in their own folder.

Step 4: Edit and mix the audio

Import audio into your own audio workstation

- We used Ableton Live, which allows you to drag and drop the video directly to timeline and turn off the video window. Thus you'll have all you need at this point: the audio.

Clean up the audio files

- The quality of home recordings varies, so be sure to clean up the files from extra noises (using e.g. RX 7 Voice De-Noise), rumbles (high-pass filter) and excessive dynamics (compressor & volume automation) and to get rid of over-emphasized frequencies; dynamic equalizer works well for this (check out Soothe plugin from the Finnish company Oeksound)

Gather voices into groups

- Gather all the voices into groups (Sopranos, Altos etc.) – you'll be able to mix whole parts instead of dozens of individual voices
- Light compression in each group (part) and the master channel, unifying equalization, careful panning, common space simulation and mastering will help you glue individual voices into a choir
- Remember to check how your master file sounds like on your phone speaker!

Step 5: Edit the video and finalize

Convert videos to unified format

- You probably received as many different video formats as your choir has singers. Therefore, convert them to a common format that your video editor (Final Cut Pro, Adobe Premiere, etc.) will natively digest
- Check your manual to find out which format is best for editing
- Be sure to include the audio with the video for later reference!

Here's what we did:

We used UniConverter to unify the video file formats. We used the original video size of the videos (which varied, but we cropped them to standard size) and converted them for editing to Apple ProRes 422, an editing format that works best with Final Cut Pro. 25 frames per second seemed to be the most common frame rate we received so we used it. We chose 1920 x 1080 pixel resolution, which requires some processing power but looks sharp when ready. When editing, it is a good idea to use proxy files to save processing power.

We dragged the mastered audio file to video editor's timeline and manually aligned all the video tracks based on the audio tracks' waveforms to a common time.

The rest is up to your own imagination. Be sure to name and color code the files carefully as there are a lot of them when working with a choir.

Have fun!