



ONLINE REHEARSAL

A GUIDE TO ONLINE REHEARSAL SOFTWARE



Funded by
the European Union



HELLO!!

This guide is meant as a starting point for those who are curious about rehearsing online and those who may have an interest in learning more about online rehearsal methods.

It is meant for both young musicians and their teachers, or anyone with an interest in the topic. It has a pedagogical section with suggestions on how to get the most out of online rehearsals, what works and what doesn't work online, and a step-by-step recipe on how to get started. It also has a technical section with suggestions to equipment and software.

The guide is the result of a collaboration between the **Norwegian Associations of Youth Orchestras (UNOF)** and the **Irish Association of Youth Orchestras (IAYO)**. It is funded by **Erasmus+**. UNOF have some equipment that members can borrow, so be in touch if you are interested in trying it out. IAYO are available to offer advice to those thinking about purchasing equipment.

Good luck!

GET STARTED WITH DIGITAL PRACTICE

Are you playing with someone online? **That's so cool!** Here, we have some tips for a successful digital practice. We've used Jamulus for the online rehearsals.

Before practice, you need the following equipment:

- Computer with Ethernet-cable (you can use Wi-Fi, but it works better with a cable)
- An audio interface connected to your computer
- A microphone connected to your audio interface with a cable
- Headphones connected to your audio interface with a cable
- Your instrument
- Your sheet music
- Your good mood, positive attitude and some patience if technical problems occur!

REMEMBER: It's useful to test your equipment before you practice with others. You'll find more information about the technical equipment in the chapter "**Technical Section**" on page **08**.

TO START YOUR PRACTICE

1. Open the program and log in to your server. You'll find more information on creating and logging into servers on page 15.
2. Type in your name and which instrument you play
3. Can you hear the others who have logged in? (Is the audio not working? Read our tips in our **"Technical Section"**)
4. Say **"Hello"** into the microphone and see if others hear you. (Is the audio not working? Read our tips in our **"Technical Section"**)
5. Is someone's volume too high? Or too low? Spend some time adjusting the volume for you and those you play with on the audio interface and computer, and the others' sound in the program. Adjust what you need to hear, and make sure the others hear you.
6. Begin practice by playing a scale or a simple song everyone knows by heart, to warm up to playing with headphones.
7. Now you can experiment and rehearse other songs. You might want to start by playing music with a slow tempo and equal rhythm before trying more difficult repertoire.
8. Remember to ask everyone if they are ready before playing, and agreeing on some **"signal words"** meaning **start/stop/pause** etc. Choose someone in the group who will be responsible for making sure everyone is ready and deciding when to stop and take a break.

USUAL CHALLENGES

- The beginning of a digital practice can be challenging because the equipment must be set up correctly, and it is unfamiliar to practice digitally. Maybe you don't know the people you're practicing with, or the conductor? It might be a good idea to have a parent, guardian or older sibling present in the beginning of practice to help with the equipment and to get familiar with playing together digitally.
- You might feel a bit lonely wearing headphones and a microphone to play together digitally. Don't worry, everyone has the same experience, and you'll get used to it eventually.
- The equipment we use doesn't have a camera, so you need to be fully focused on what you're playing and listening to the others.
- It might be a good idea to use a metronome or for someone to count out loud to practice playing the same tempo. Start out slow, and increase the speed as you go, when you're ready.
- When playing in different places with different connections, the latency may vary. This can lead to some playing less accurately than others.
- Is there a lot of latency on your side? Or is the sound stuttering? Check if anything can be disconnected from your network while you're playing. For example, phones or TVs in the house.
- Sometimes, what you hear in your headphones might be delayed, making what you're playing and what you're hearing out of sync. This can be a little uncomfortable. Even if everyone playing is connected to different connections, and you are far apart, it might still be in sync for others. So, you should continue playing, even if it doesn't sound quite right.

TIPS FOR TEACHERS AND CONDUCTORS

- Getting started with digital practice can be challenging, as you need to learn how to use the equipment, as well as being in an unusual situation. That's why it's important to be patient in the beginning.
- Since you won't be able to see each other, the practice will need a leader. Explain what will happen and the meaning of words/signals.
- Make sure everyone is ready before beginning, you won't be able to see them without a camera.
- Start out with small parts. It's difficult to notice if someone has stopped playing, as you can't see them.
- Spend time learning which level the musicians are on, and which techniques/positions/terms they are familiar with. Without a camera, you won't be able to demonstrate on the instrument, so use words or sounds.
- Is it challenging for the musicians to play in the same tempo? Use a metronome or count out loud and ask everyone to follow.
- Choose music with rhythm and tempo that everyone can master in the beginning, to get familiar with the equipment before moving on to more challenging repertoire.
- We recommend short practices, as digital practice demand a lot of concentration.
- It's easier to follow the other musicians if there are fewer participants. That's why we recommend not being more than 2–5 musicians the first time using the equipment.

WHAT CAN DIGITAL PRACTICE BE USED FOR?

- Digital practice is great for rehearsing notes and getting to know the music. It can be used in preparation for a seminar, additional practices between physical meetings, group practices between orchestra rehearsals, etc.
- Has travel time, finances or time constraints put an end to orchestra activity or seminars? Maybe digital practice can create opportunities to meet and more interaction for musicians?
- You will become a more attentive listener by using digital practice, since you'll need to listen closely when you can't see the other musicians you're playing with.

WHAT SHOULD YOU CONSIDER ABOUT DIGITAL PRACTICE?

- When playing together digitally, the musicians concentrate on what they're playing and what they're hearing from the others through their headphones. For some, keeping up and trying to play together is enough. Therefore, it might be difficult to work musically with phrasing and dynamics while playing.
- As latency can make it challenging to play together, playing pieces with difficult rhythmic and high tempo is hard.
- It's important to have a good connection while playing together digitally. Check the speed of your internet and disconnect anything that doesn't need internet during practice. All other traffic on the connection can lead to latency in the audio transfer.
- If possible, use a computer with an Ethernet cable. You can use Wi-Fi, but speed and latency can vary with a wireless connection.
- Do you only have an iPad? There is an app for iPads as well, but it works best with only two people playing together.
- Remember to use a microphone and headphones that are connected to the computer with a cable. Headphones connected via Bluetooth can lead to delayed sound, making it difficult to play with others.
- Digital practice won't replace physical practice but can be an addition without having to travel far to meet.

EQUIPMENT YOU WILL NEED

YOUR INSTRUMENT

This probably goes without saying, but to play with other musicians you're going to need your instrument!



A MICROPHONE, A CLIP AND MAYBE A STAND

Depending on the instrument you play, a different microphone might be used. There is a list of recommendations of microphones you can start with in the next section. Some microphones can clip straight onto your instrument, but some need to clip onto a stand and aim at your instrument. Whichever you use, make sure you have a way for your microphone to be hands-free!



AN XLR LEAD

An XLR lead will connect your microphone to your audio interface.



A USB AUDIO INTERFACE

This piece of tech will take the audio signal from your microphone and convert it into a digital signal for your computer. Make sure to get a USB interface that works with your computer's operating system.



WIRED HEADPHONES

You will need wired headphones to hear other people on the server. The headphones have to be wired because wireless headphones add more of a delay to the sound, and you won't be able to play in time with other musicians.



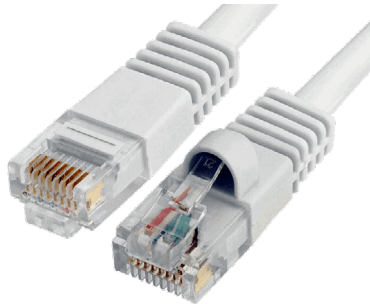
COMPUTER OR LAPTOP

To use Jamulus (and many other online jamming programmes), you need to use a computer. Unfortunately, it **can't** be run on a tablet.



AN ETHERNET CABLE

An Ethernet cable is a cable that you connect between your computer, and a router, modem, or network switch. It makes your connection faster and more stable, which makes the latency in programmes like Jamulus much lower. Depending on your computer, you may need an Ethernet to USB adapter.



ADAPTERS

You may need a few different adapters depending on your device – for this set up your computer will need to have **USB ports** and an **Ethernet port**. If it doesn't, don't worry! You can get USB-C and Ethernet adapters online. You're also going to need an adapter to plug your headphones into the audio interface.



GETTING STARTED

RECOMMENDED EQUIPMENT

There are so many options for different interfaces and microphones that it can be quite overwhelming. Here are some recommendations to get you started.

MICROPHONES

- [For clipping onto the instrument \(Best for strings, woodwind, brass, piano\)](#)
- [For clipping on a mic stand \(Best for vocals, drums, guitar\)](#)

INTERFACES

- [Best for Budget*](#)
- [Best All Around](#)

*While there are cheaper interfaces available, I would strongly recommend against going too cheap, as some interfaces do not have audio drivers available. This makes using Jamulus more difficult.

ADAPTERS

- [Headphone jack](#)
- [Ethernet to USB](#)
- [USB-C adapter for USB and Ethernet](#)

PS. You can find links to the equipment on page **18**.

WHERE TO DOWNLOAD JAMULUS

You can find the download for Jamulus [here](#), on the Jamulus Getting Started page. Make sure to download the file that matches what system you're working on, whether that's Windows or Mac. Once you've downloaded the file, it's time to install it! Run the .exe file (Windows) or .dmg file (Mac) that you downloaded from Jamulus and follow the installation instructions.

FREQUENTLY ASKED QUESTIONS

What is Latency?

Latency in this case refers to the time delay you hear when performing with other musicians online.

What is JACK?

JACK is a sound server optimized for the demands of audio production work – it's an abbreviation of *JACK Audio Connection Kit*

Can I use Jamulus over Wi-Fi?

Short answer, not really. Longer answer, yes, but you will experience more issues, interruptions, delay, and sound issues than if you use Ethernet.

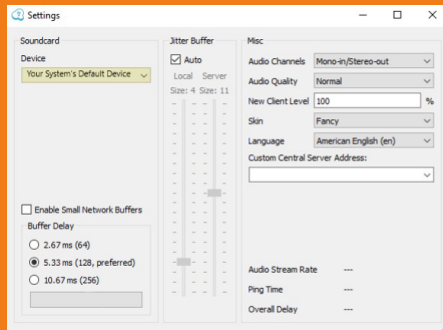
Can I use other programmes like Teams or Zoom at the same time as Jamulus?

No.

HOW TO GET SET UP

Now that you have downloaded and installed Jamulus, and connected your interface to your computer, make sure to close any other software you might have running as anything open could interfere with the audio settings.

1. Open up the Jamulus software and click the button that says “**settings**”, it should bring up a new window that looks like this:



2. Click the **Soundcard Device** dropdown menu, the one highlighted in yellow above, and switch the soundcard to the driver that matches your USB interface.

If you haven't already, you may need to download an audio driver for your interface.

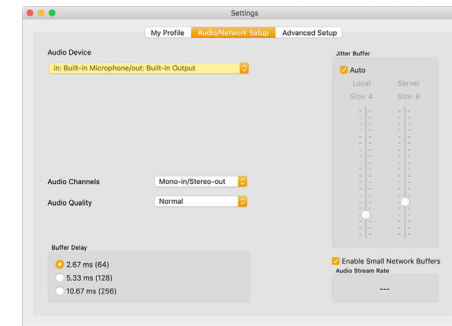
SETUP FOR ETHERNET CONNECTION

Connect the Ethernet cable to the port on your computer (check if you need one of the adapters listed above!)

Go to the search bar beside the windows button and search for “**Ethernet Settings**”. Click on Ethernet connector and connect. **You're ready to go!**

Now that you have downloaded and installed Jamulus, and connected your interface to your computer, make sure to close any other software you might have running - open could interfere with the audio settings.

1. Open up Jamulus and click the **settings** button, you should now see the window below:



2. Click the **Soundcard Device** dropdown menu, the one highlighted in yellow above. Find the input you wish to use, and then if you are using your computer for headphones output, click **System Default Out**, or click the **USB interface in and out** if you are using the audio interface for your headphones.

SETUP FOR ETHERNET CONNECTION

Connect the Ethernet cable to your computer Ethernet port. Or, if your computer doesn't have an Ethernet port, try using a USB to Ethernet adapter, or a Thunderbolt to Gigabit Ethernet adapter.

Open **System Preferences**, and open **Network**.

Select **Ethernet** in the list on the left. It should connect automatically.

Birgitte Mikalsen is chairwoman of the of the board of **De Unges Orkesterforbund** (since 2016). She grew up in the orchestra environment in Mosjøen and got a place on the orchestra boards early on. Birgitte has a master's degree in Musicology from NTNU and further education in Cultural Management. Birgitte now works as a culture schoolteacher for cello and orchestra at Stjørdal Kulturskole, organizational consultant for Ung Kirkesang and as a producer for Alpaca Ensemble while doing her MBA in strategy and management.

Caitlin Kelly is a **MTU Cork School of Music Bachelors of Popular Music** graduate. From the very beginning, she had a keen interest in Music Technology, an interest that grew into a love as time went on. She has worked multiple sound design, sound engineering, and technical advisory positions, including working for IAYO and Sing Ireland on their online string ensemble and choir projects. She is incredibly passionate about music technology and has worked on several live gigs over the last few years, as well as doing both audio and visual streaming, including the CSM Specialised Pop Performance series. She is currently studying in CSM as PhD candidate.

Download Jamulus

<https://jamulus.io/wiki/Getting-Started>

the t.bone Ovid System CC 100

https://www.thomann.de/ie/the_tbone_ovid_system_cc_100.htm

the t.bone MB85 Beta

https://www.thomann.de/ie/the_tbone_mb85_beta.htm

Presonus AudioBox USB 96 25th Anniv Ed

https://www.thomann.de/ie/presonus_audiobox_usb_96_25th_anniv_ed.htm

Focusrite Scarlett 2i2 3rd Gen

https://www.thomann.de/ie/focusrite_scarlett_2i2_3rd_gen.htm

the t.bone Headphone Adapter

https://www.thomann.de/ie/the_tbone_headphone_adapter.htm

TP-Link USB 3.0 to Gigabit Ethernet Network Adapter

https://www.amazon.co.uk/TP-Link-Ethernet-Ultrabook-Chrome-book-UE306/dp/B09MFY8799/ref=sr_1_4?crd=YV6EMZAJLMP-Z&keywords=ethernet+to+usb&qid=1682265785&sprefix=ethernet+to+usb,aps,116&sr=8-4&th=1

USB C Hub Docking Station Lemorele

https://www.amazon.co.uk/Lemorele-Multiport-Ethernet-Compatible-Chromecast-Gray/dp/B09M3QN4D6/ref=sr_1_9?crd=23R7VATBCKV7N&keywords=USB+C+usb+port+hub&qid=1682265870&sprefix=usb+c+usb+port+hub,aps,75&sr=8-9&th=1

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