

Handout Home Studio Tips

Because of the current decrees, a maximum of two people can participate in a live show at Radio ORANGE 94.0. You can produce shows at home in your 'homestudio'. On the following pages we will explain and discuss how to do this with manageable effort and as little technology as possible.

In this handout you will learn which Hard- and Software (for the most common operating systems – Linux, Windows, Mac) is needed. We will present a selection of suitable tools and explain the workflow of a radio show producer.

1 Producing radio shows at home

It is not too hard to make a radio show from home. Whether it is a music show or a 'produced contribution' (news, reports, radio plays) – everything can be done from home!

You are the host of your show. The *moderation* is what brings together the various parts of the show. It creates a connection to the listeners by addressing them directly and piquing their curiosity, by guiding through the program and by presenting and summing up the content.

Hardware Tips: What do I need?

- **Recording device**
- **Laptop/PC** for audio editing

> Recording device:

It is possible to borrow recording devices from Radio ORANGE 94.0 at our office opening hours. At Radio ORANGE 94.0 we mainly work with OLYMPUS and ZOOM.

These devices can be used as microphones/ USB-audio interfaces to record directly into your audio editing software/DAW (Digital Audio Workstation).

An audio interface is a device that connects external audio devices like microphones, amplifiers, mixing consoles and/or electric instruments. It allows you to produce high quality audio content at home.

In the *Menu* of your recording device you can choose whether you want to use it as a SD card or an audio interface. After choosing *Audio Interface* on the ZOOM H5 you can choose between *Stereo* or *Multi Track* to either use it as a 2-in/2-out or as a 4-in/2-out interface.

More detailed instructions can be found in the manual:

https://www.zoom.co.jp/sites/default/files/products/downloads/pdfs/D_H5_1_0.pdf

> Loop Back function of the ZOOM H5 (Stereo only)

It is possible to mix a signal from your computer (or iPad) with the input signal of the ZOOM H5 and send it back to the computer or iPad (Loop Back). Note that this is only possible when you use the device in *stereo* mode. By using this feature, you can for example mix comments with background music from your computer and record this mix with suitable software or stream it on the internet.

> Headphones and headsets:

Each OLYMPUS- / ZOOM-Set at Radio ORANGE 94.0 includes a headphone with a stereo connector (mini jack with 2.5 mm diameter) and a 3.5 mm adapter.

A headset is a combination of a headphone and a microphone that allows for two-way communication (listening and speaking).

Radio ORANGE 94.0 does not have any headsets that can be borrowed. Headsets usually come with a 4-pole mini-audio-jack (one additional pole for the microphone – compared to 3-pole headphone jacks). To connect a headset to a soundcard, an additional adapter is needed that splits the microphone and headphone signal.

> Smartphone apps

You can use various mobile recording devices (like your smartphone or tablet) for recording at home. Most smartphones will come with a pre-installed function that give you the opportunity to record your voice (and any other acoustic signals). These recordings can either be played back on the smartphone or be transferred to another device.

Here we will give you an overview of some exemplary apps that you can download from your app-store. These apps are capable of more than just audio recordings and facilitate the (post-)editing of your recorded interviews. Especially when working with smartphone/iPad/tablet apps, one should pay attention to the settings of the recording quality. Ideally, the app should be able to record with a sample rate of 44100 Hz and a bit depth of 16 bit which will allow for recordings with a great quality.

- Android

The following apps are the result of a search for apps that also have a feature to record telephone calls, which was not successful. The possibility to record telephone calls depends not only on the app but also on the smartphone model and the OS (operating system) version. The following apps are audio recorders without the possibility to record telephone calls.

- *Audio Recorder (1)* – easy to use app that supports recording with 8 to 48 kHz. Recordings can be stored as *wav* (uncompressed) or *m4a* (with adjustable compression rates) files. While recording, the app will generate a graphical representation of the audio data in real time (just like in Audacity). The app is open source and without advertising.
<https://play.google.com/store/apps/details?id=com.dimowner.audiorecorder>
- *Audio Recorder (2)* – is another open source recording app without advertising that also supports several compressed file formats but without the option to select a compression rate. Apart from that, it provides similar features like Audio

Recorder (1) (e.g. graphical representation of the recorded data in real time).
<https://play.google.com/store/apps/details?id=com.github.axet.audiorecorder>

- iOS

- *Ferrite* – an app to record speech or/and to make podcasts, journalistic radio articles as well as professional voice recordings like speeches, presentations, voiceovers, etc. Its functionalities include recording, editing and exporting. The quality of voice recordings is better when recorded with Ferrite than with Apples pre-installed *voice-memo* app. *Ferrite* combines the functionalities of a simple recorder with a multi-audio-track editing studio. The recordings can be renamed, tagged, rearranged and sorted in a library. Before (and during) recording the level can be adjusted easily. The app also works with external microphones. The free version of the app has a time limit for recording and editing projects. A paid upgrade offers the possibility for projects with a duration up to 24 hours.
<https://apps.apple.com/de/app/ferrite/id1018780185>
- *Hokusai Audio Editor* – is a free of charge multi-track audio editor. Recording, editing and exporting is possible. *Hokusai* provides many useful editing tools, e.g. show/hide, loudness normalization, etc. A chargeable upgrade of the app provides additional functions and audio effects.
<https://apps.apple.com/de/app/hokusai-audio-editor/id432079746>
- *WavePad* – A free audio and music editor for recording and editing music-, speech- and any other audio recordings. It contains several tools to edit audio files like cutting, copying, pasting. Furthermore, you can add audio effects like echo, amplification and noise suppression. WavePad can also be upgraded.
<https://apps.apple.com/de/app/wavepad-music-and-audio-editor/id395339564>

Recording quality

You should keep a few things in mind before, during and after recording to ensure the best quality.

Before recording:

- *Equipment check*: Battery, cables, connectors, microphone pop-filter
- *Quiet environment*: Avoid (loud) surrounding noises. Do not record in their direction.
 Indoor noise sources: computer fan, fridge, neon lights, coffee machine
 Outdoor noise sources: busy streets, construction sites, crowds

During recording:

- Use *Headphones* to have optimal control over your recording and to make sure you can hear everything that is present within your recording. Usually background noise is only audible on headphones.
- Check and make sure your device is *actually recording*.
- Always pay attention to the *volume level* of your device to avoid overdrive/clipping or too quiet recordings.

After recording:

- Save the data on your PC
- Edit the recording

> Audio editing:

A Guide with tips for editing audio material with Audacity can be found here:

https://o94.at/sites/default/files/2018-07/160419_Audacity-DE.pdf

2 Producing radio shows from home with guests

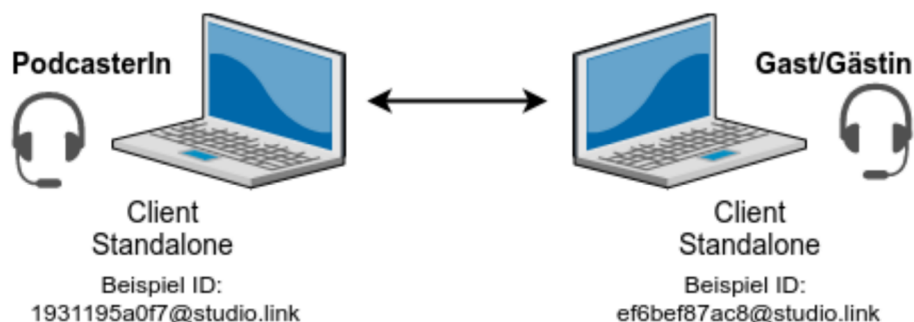
Various online platforms offer the possibility to interview people or have discussions with even more people from their homes and their own home studios. We will present some possibilities for audio (*Studio-Link*) and/or video (*Zoom*, *Jitsi*, *Fairmeeting*) conferences. Since the features and functionalities of such tools are similar, it is easy to understand and work with different tools as soon as you learn how to use one of them.

Studio-Link

<https://studio-link.de/>

How does it work?

Studio-Link only works for audio recordings. An individual number will be assigned to each *Studio-Link* client. It is displayed under *Your ID*: (e.g. 1234568@studio.link). Each client can be called by this number, like with a conventional telephone. This number is assigned at the beginning and always stays the same.



The quality of the recording will depend on the equipment of all participants of the voice conference. It is important to use closed-back headphones while recording (or to turn around your speakers if necessary). Otherwise feedback/echo can occur. Which means that you can hear your own voice with some delay. To enhance the quality of your recording have the conversation in a quiet place with sound absorbing surroundings like

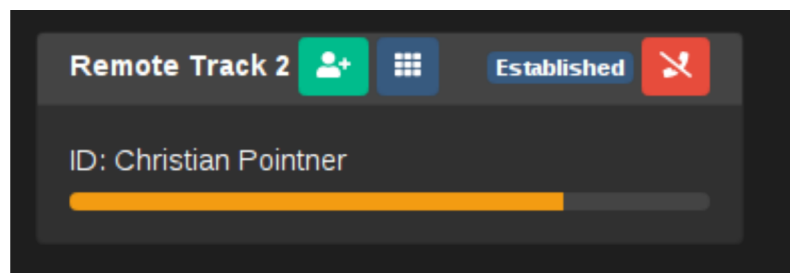
curtains, carpets, much furniture and close all unnecessary programs on your computer. Furthermore, make sure you are not down- or uploading anything in the background on your computer.

Download the standalone version here:

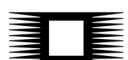
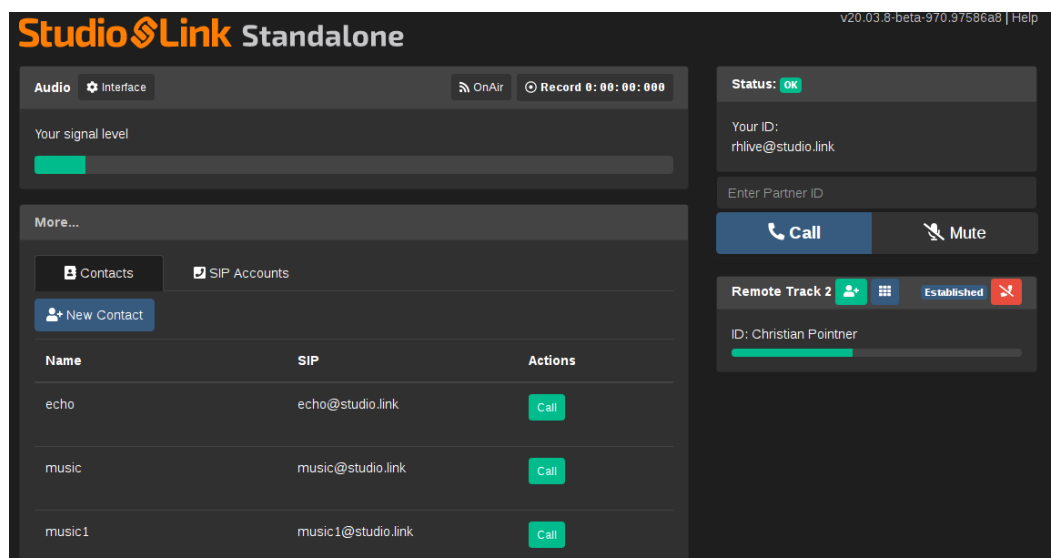
<https://doku.studio-link.de/standalone/installation-standalone.html>. You do not have to install it. The downloaded Zip-file already includes the executable program. The same must be done by your guest(s). Up to 6 guests can participate in one conversation (only audio, no video). When starting the standalone version, a browser tab will open automatically. Instructions can be found here:

<https://doku.studio-link.de/standalone/erste-schritte-standalone.html>.

The signal level of your own voice is displayed under *Your signal level*. The recording signal level in *Studio-Link* can reach the orange values/area. If the signal level is in the red area of the display, the distance from speaker to microphone is either too short or the signal gain of the amplifier is too high. This can be solved by adjusting the level in your operating system (Linux, Mac, Windows).



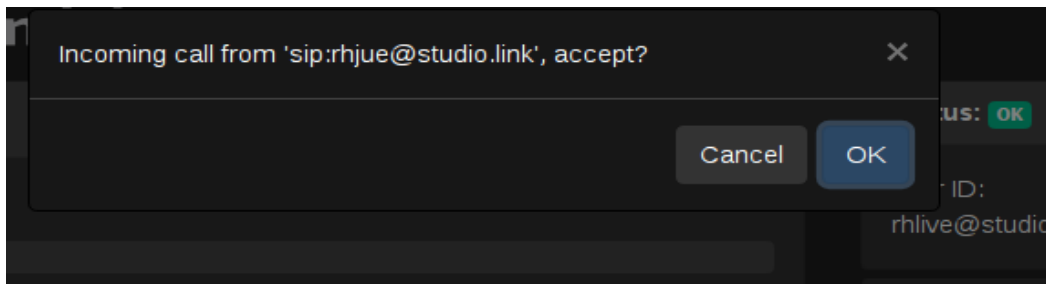
You can test the level before the recording using the *'Echo'* function! Echo means speaking into the microphone and listening to the recording through the *Studio-Link* server.



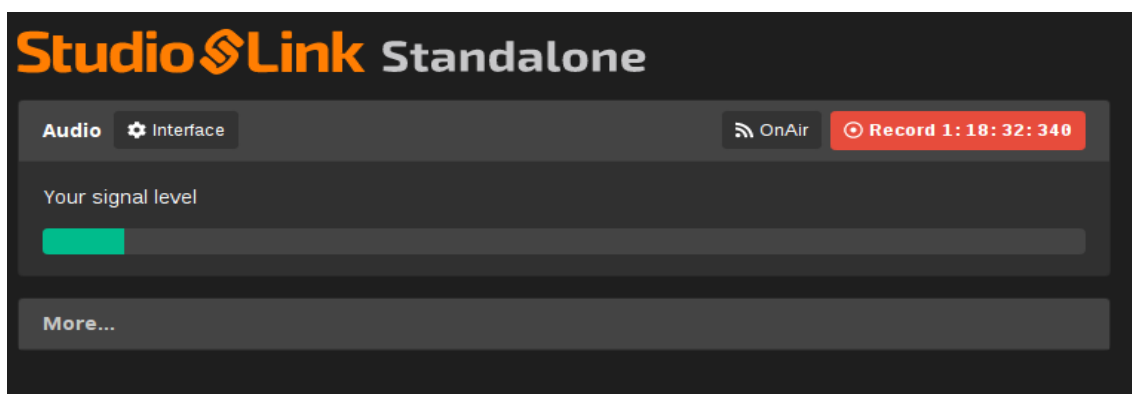
Starting a phone call/recording

Studio Link can be used to record conversations. Each participant will have a dedicated recording track. The advantage: each track can be edited separately. The file format is *flac*: an audio file format with lossless compression. The recordings will be saved in a *Studio-Link* folder which will depend on the operating system.

You can call someone by using 'Enter Partner ID'. A window will pop up if someone calls you.



As soon as the connection is established, a local recording can be started by clicking the *Record* button. Your own voice recording will be stored in a file called *local.flac* – the voice recordings of your participants will be named *remote-track-1.flac*, *remote-track-2.flac* etc. Although the recordings of the *remote-track-1.flac* are in an acceptable quality, the *local.flac* files will usually have a better quality than the recordings of remote participants. To ensure the quality of the final cut/edit of the conversation, it is recommended that each participant will record his or her own *local.flac* file and send it to the host (e.g. via a cloud). Our recommendation is to record with Audacity simultaneously – if this is supported by your soundcard or/and your operating system.



ZOOM

<https://zoom.us/>

To speak from our experience, *Zoom* currently is the most stable tool for video conferences, online meetings and group chats. You can join a meeting through an email invitation, a chat invitation inside the browser, through your *Zoom* desktop or mobile application and with a smartphone or telephone.

Functionalities of Zoom:

- Invite people via email or SMS
- Group or private chats
- Record the meeting
- Share your desktop view (e.g. for whiteboard/comments)
- Mute/Unmute audio
- Stop/Start video
- Configure settings
- Leave or end meetings

You can register and log in here: <https://zoom.us>. *Zoom Basic* (free) has a time limit of 40 minutes for meetings with up to 3 participants. There is no time limit for meetings with only 2 participants. After starting you have 3 basic options: You can 'Join a meeting', 'Host a meeting' or 'Schedule a meeting'.

1. 'Join a meeting'

You do not need an account to join a meeting. You can join a meeting, which is hosted by another person (host) if you have the meeting-ID or a link:

Mischa G. Hendel is inviting you to a Zoom-Meeting.

Join Zoom-Meeting: <https://zoom.us/j/5966816893?pwd=czl2bGlrQzZVcVpsR3NiWkdweTJrQT09>

Meeting-ID: *** ** *893

Password: *****

2. 'Host a meeting'

To host a meeting, you need to register and create an account. After logging in, simply click on 'Host a Meeting'. The desktop application will download automatically. Give your meeting a specific name regarding its topic.

Ein Meeting planen

Thema

ORANGE 94.0 Home Office

Beschreibung (optional)

Geben Sie Ihre Sitzung Beschreibung

Wann

25.05.2020

10:00

AM

Dauer

1

Std.

0

Min.

Der Zoom Basic-Plan sieht ein Zeitlimit von 40 Minuten für Meetings mit mindestens 3 Teilnehmern vor.
Aktualisieren Sie Ihren Plan jetzt, um von unbegrenzten Gruppenmeetings zu profitieren.[Jetzt aktualisieren](#)

☒ Diese Meldung nicht mehr anzeigen.

Zeitzone

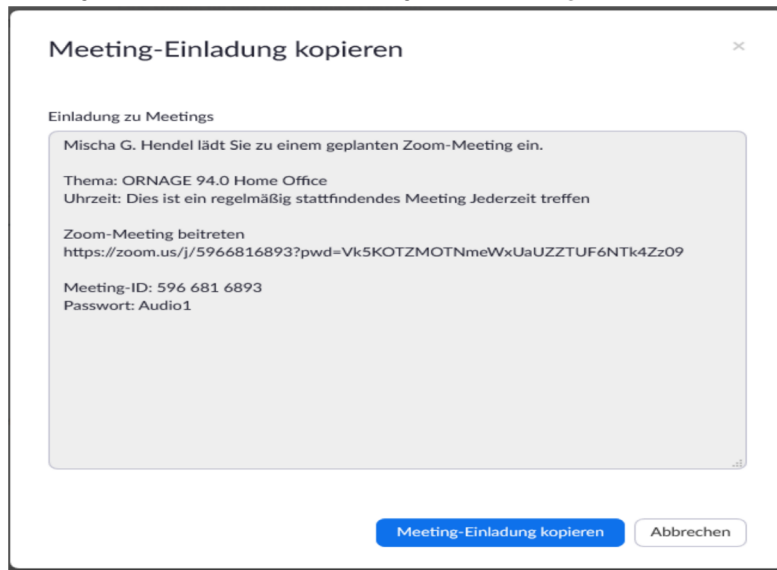
(GMT+2:00) Wien

You can adjust the setting for your meeting, e.g:

- Periodic or one-time meeting
- Meeting password
- Enable the participation of a moderator
- Mute/Unmute participants
- Enable waiting room
- Record a meeting on your local computer




You are the host and you can invite others to your meeting:



'Host a Meeting' is actually the same as 'Schedule a meeting'. The only difference is that the meeting will start immediately under option 'host'.

Zoom profile and settings

Before you start to host meetings, it is recommended to adjust the settings of your profile. Under *Profile*, you can change your name, add a picture (which will be displayed whenever your video is deactivated in a call), add a role/position within the meeting, etc.



Mischa G. Hendel

Abteilung Radio Orange Wien

Stellenbezeichnung Radiotrainer

Ort Wien

[Ändern](#)
[Löschen](#)

Persönliche Meeting-ID	<div>*** ** *893 Anzeigen</div> <div>https://zoom.us/j/*****893?pwd=***** Anzeigen</div> <div>× Diese ID für Instant Meetings verwenden</div>
Anmelde-E-Mail	<div>mis***@o94.at Anzeigen</div> <div>Verknüpfte Konten: </div>
Benutzertyp	Basic Aktualisieren
Kapazität	Meeting 100
Sprache	Deutsch

Under *Settings*, it is possible to set the rules for the meeting and the rights the participants have. For Example:

- Join before host: Allows the participants to join the meeting before the host.
- Mute participants upon entry: This will mute every participant when they join.
- Chat: Allow participants to send public or private messages.
- Data transfer: Hosts and participants can send files in the chat of the meeting.
- Screen share option: Allows participants and hosts to share their desktop view.
- Annotation: Allow for usage of annotation tools.
- Whiteboard: Allow the participants the usage of a whiteboard tool.

Recording with Zoom

It is possible to record either the video and audio or only the audio of a *Zoom* meeting. The video and audio files will be stored locally on your computer. The host has to record the meeting or allow participants to record it.

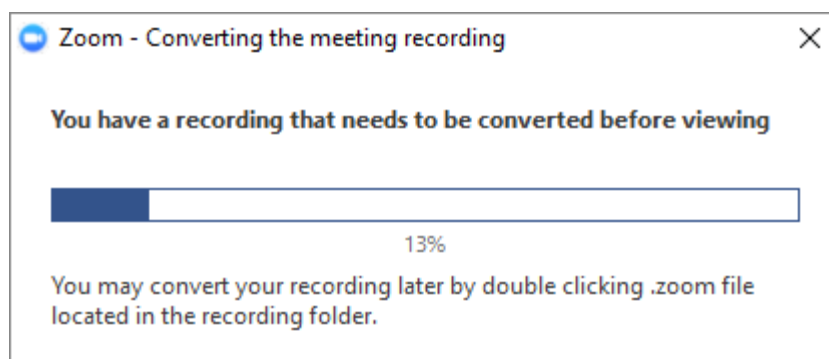
- Start a *Zoom* meeting as a host.
- Click icon *Record*.
- Choose *Record on this Computer* in the dropdown menu



Hosts and participants can see the recording symbol in the top-left corner.



At the end of the meeting a message comes up that says: 'You have a recording, that needs to be converted'. You have to wait until the conversion is done before you can access the file.



The audio-/video file (MP4) will be named 'Zoom_0.mp4' automatically. The file containing only audio data (M4A) will be named 'audio_only.m4a'. It is also possible to stop or pause a recording during a *Zoom* recording.

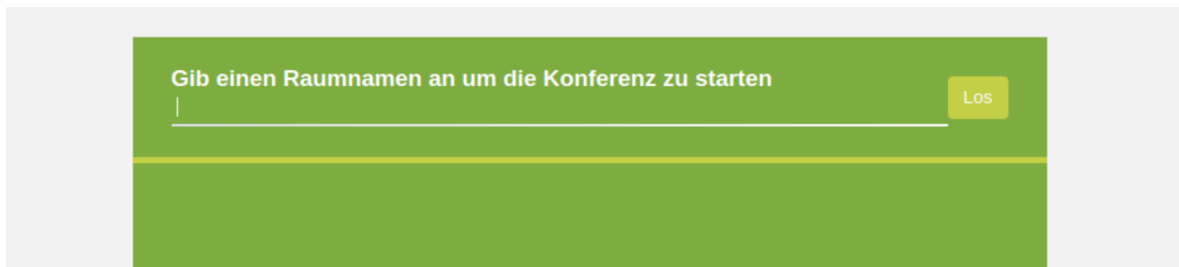
Further information and support can be found here: <https://support.zoom.us/hc/de>

Fairmeeting

<https://fairmeeting.net/>

How does it work?

Just access their homepage, enter a *Room name*, share the link, done.



A little more in detail: Establish an URL like <https://fairmeeting.net/myroom> and you can use the room whenever you need it. Use a name that is not easy to be guessed to avoid unexpected visitors. Share the URL as a link. The first one to join the meeting will have the host rights (e.g. mute or exclude participants). Therefore try to join the meeting first if you do not want others to have more rights over your meeting than you have. Up to 50 participants are possible in one room (up to 100 for only audio conferences). This video conference service does not have any limitations and participants do not have to register.

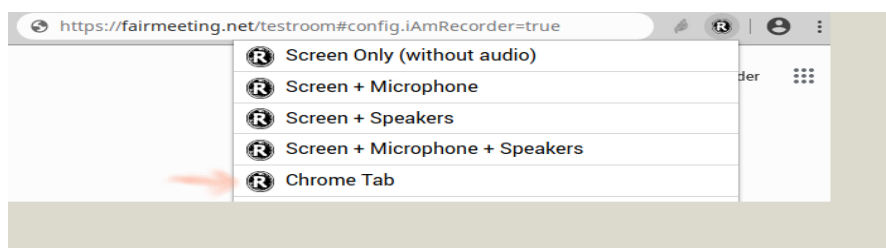
Apple/OSX users must allow browsers to access microphone and camera. This can be done in the system control under *security/privacy*. In Windows, the usage of a camera within a browser may have been deactivated by the system administrator.

Fairmeeting contains tools that allow online classes and presentations. Important: *fairmeeting* is based on *Jitsi* and works best with *Chromium* or *Google Chrome* (since it uses WebRTC multicast to save bandwidth). In *Firefox* malfunctions may happen (some participants cannot hear others, etc.). *Safari* is not recommended. Users must deactivate the 'WebRTC Unified Plan' feature in the developer- settings.

Call/Recording

This function is not directly part of *fairmeeting*. A recording can be performed within the *Google Chrome/Chromium* browser with a RecordRTC extension.

<https://www.webrtc-experiment.com/RecordRTC/>



Further tips:

1. Mute your microphone whenever you are not talking
2. Mute video to save bandwidth for other participants
3. Use the chat to share meta information like links
4. Share your desktop to show something
5. Structure your meeting (make notes)

Further documentation can be found here:

<https://git.fairkom.net/hosting/fairmeeting/-/wikis/Wiki-Deutsch>

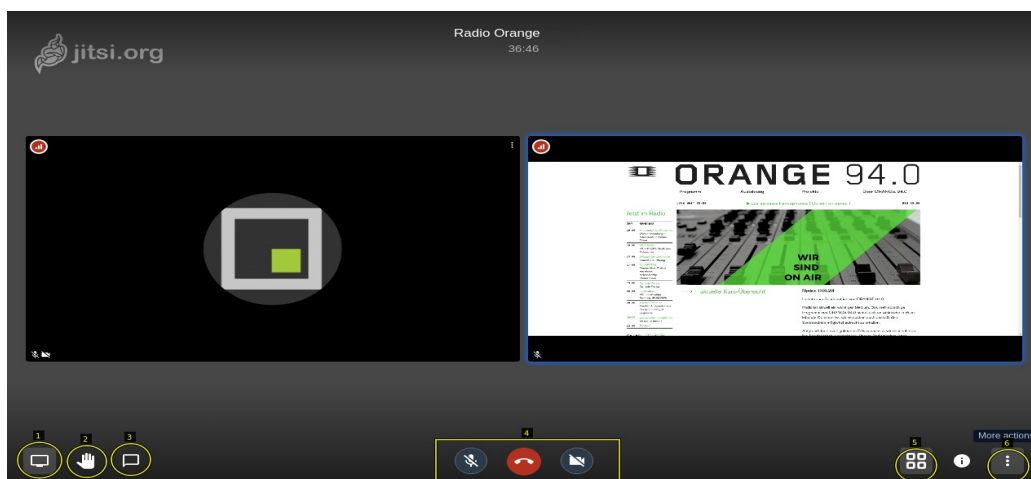
Jitsi Meet

<https://meet.jit.si/>

Jitsi is another open source video conference tool. It does not require a registration or account. Before you can start a conference with Jitsi a 'room' needs to be opened: Simply go on their homepage, enter a 'roomname', share the link to your room, done.

In *Jitsi* it is possible to start a recording directly in the program during an interview. But you will need a Dropbox account for this. The recording will be saved directly to our Dropbox. After your recording, it is important to wait until the conversion of the file is completed before you close the program.


Jitsi Meet includes all conventional features: Video, audio, and textchat, as well as sharing your own screen (or just some parts of it) with others. Further features: Protect your 'rooms' with passwords. It is especially recommended for groups of up to 10 participants.




Functions of Jitsi:

1. Share your screen
2. Signal that you want to say something
3. Chat
4. Switch microphone/camera on/off or leave the room

Further tips for video conferences:

- *Set a profile name:* It is highly recommended to set a profile name to avoid confusion. In fact, each participant should set a profile name. Click the  in the bottom-right corner to open a menu where you can change your profile settings.
- *Mute your microphone:* In conferences with multiple participants it is advisable to turn off the microphone whenever it is not your turn to talk. Only one person at a time (moderator/ current speaker) should have his or her microphone turned on.

This will avoid unnecessary background noise (overlap) from those participants only listening.

- *Give signals:* In the left bottom corner you can find a 'Hand' button by which you can signal that you want to be the next speaker.
- *Reduce video quality:* Sometimes video or/and audio may not run smoothly. To avoid this, click  to get to the menu. Under 'Manage Video Quality' you can pick 'Low Definition'. This will save bandwidth.
- *Set a password for you room:* The connection to Jitsi is encrypted. But anyone with the link to your room can enter it. Therefore, it is recommended to set a PIN code to protect your conference from unexpected visitors.

A variety of alternative public self-hosted servers can be found under <https://jitsi.rocks/>

More info: https://support.o94.at/wiki/Public:Video_Konferenz_mit_Jitsi

3 Producing radio shows live from home

With Studio-Link live on air:

<https://studio-link.de/>

Studio-Link makes it possible to go live on air with your radio shows from home. A *stream on location* on the receiver side in Backend is set up. Please refer to *chapter 2* ('Producing shows from home with guests') for the set-up of *Studio-Link*.

The stream will be an *upload*. That means, one or more files will be uploaded. These files serve the control of the playout system. Particularly, they establish a link to the streamed signal. It is a pure text file (no control characters!) with a M3U extension. This M3U file is a playlist that instructs the system what to play. The procedure is simple:

1. Start a meeting with all participants via the standalone version of *Studio-Link*. Now, one of the participants has to click → *On Air*. This should open a new browser tab where you should be able to choose between *Preshow*, *Live* and *Break*. Here, choose *Preshow*.

2. Use → *Edit Stream* to change the name and especially the so-called Slug. Here is an example of a playlist: *studio_link_playlist_o94spezial.m3u* – it looks like this from the inside:

```
http://stream-master.studio-link.de/o94spezial.mp3
http://stream-master.studio-link.de/o94spezial.mp3
http://stream-master.studio-link.de/o94spezial.mp3
http://stream-master.studio-link.de/o94spezial.mp3
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http://stream-master.studio-link.de/o94spezial.mp3
http://stream-master.studio-link.de/o94spezial.mp3
/data/yarm/streaming_fueller/streaminginterruption_announcement_1.mp3
http://stream-master.studio-link.de/o94spezial.mp3
(...)
```

The file */data/yarm/streaming_fueller/ streaminginterruption_announcement _1.mp3* contains an announcement and a short piece of music. The announcement can relate to streaming interruptions/issues and inform the audience that you are working on restoring the connection. But it also can be just music. Here the paths:

```
/data/yarm/streaming_fueller/streamingausfall_ansage_1.mp3 ODER
/data/yarm/streaming_fueller/streamingausfall_ansage_2.mp3 ODER
/data/yarm/streaming_fueller/streamingausfall_ansage_3.mp3
```

```
[UPLOAD NEU] - empfohlen, mit Fortschrittsanzeige und verbesserter Performance
Vorsicht - NICHT für Microsoft Internet Explorer (MSIE) geeignet!

[upload alt] - ohne Fortschrittsanzeige, nur für Internet Explorer (MSIE) gedacht
Wir empfehlen Verwendung von Firefox, Opera, Safari, oder Chrome Browser und UPLOAD NEU (siehe oben)

1786219_01_studio_link_playlist_o94spezial.m3u Mon Apr 20 16:19:33 2020
Total length of uploaded files: 0:0
```


To parry and avoid connection delays and issues you can – or even should – enter the address multiple times. Such a playlist is uploaded instead of pre-produced audio files in the Backend to a desired receiving end. The stream URL is included 10 times (just to be sure) followed by an audio file which is locally stored on the playout server (e.g. streamingissue_announcement_1.mp3) followed again with 10 times the stream URL (= 10 connection attempts of the player etc.). This procedure proved its reliability in dealing with connection issues. When the stream is permanently interrupted or when there are no files to stream, the system will switch to an emergency program.

3. Switch from the status *Preshow* to *Live* a few minutes before the begin of your show.

On air

- On one hand it is important *to close as many programs as possible* running on your computer and stop all unnecessary uploads/downloads. A video tool on the other hand can be very helpful for gestures. But this should only be used when every participant has a good internet connection. Additionally, do not forget to mute every participant who is not talking.
- Always keep an eye on the *level display* and use headphones to avoid noise, adjust background music and transmit a stable signal.
- *Keep clam* when a mistake occurs. Afterwards nobody will remember it, except if you point it out too often.
- *Always be one step ahead*: Ideally, the next song and contribution is ready to play during moderation already. This way no pauses will occur.
- *Keep an eye on the clock*: How much time is left?

Attention should be paid to the unknown delay of every internet stream. You will not be able to know the exact delay until you start the livestream. It can be a delay of approx. 10 seconds or even more. This makes it hard to exactly know when the show begins. Starting at a well-defined time and starting slowly after a few seconds should work fine. Possibly a little bit of music can be sneaked in. But not too much since the audio-quality will not be the best.

A click on 'Record' by every participant will start a recording in unimpaired quality. By bringing together all these local recordings it is possible to produce the show afterwards in the best possible quality by post-editing them (e.g. in an audacity project).

Sources

Sprechkontakt: <https://www.sprechkontakt.at/2020/04/radio-von-zuhause/>

Radio FRO: <https://www.fro.at/kostenloser-online-workshop-heimstudio/>

Radio Helsinki: https://ausbildung.helsinki.at/Studio_Link_deu

Mosaik-Blog: <https://mosaik-blog.at/jitsi-online-aktivismus/>

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