Digitizing Analog Audio Sources Using Audacity

Introduction

There are many ways to digitize and edit audio, all of which are dependant on the hardware and software used. This workflow provides instructions for digitizing analog audio using Audacity – a free and open source software program.

These instructions and screenshots are taken from Audacity 2.2.2 on a Windows machine, and will vary depending on version and operating system. Audacity is a free, easy-to-use, multi-track audio editor and recorder for Windows, Mac OS X, GNU/Linux and other operating systems and can be downloaded here:

- https://www.audacityteam.org/download/

For more information about audio digitization, view related items connected to this resource on the Sustainable Heritage Network in the "Audio Recordings" category.

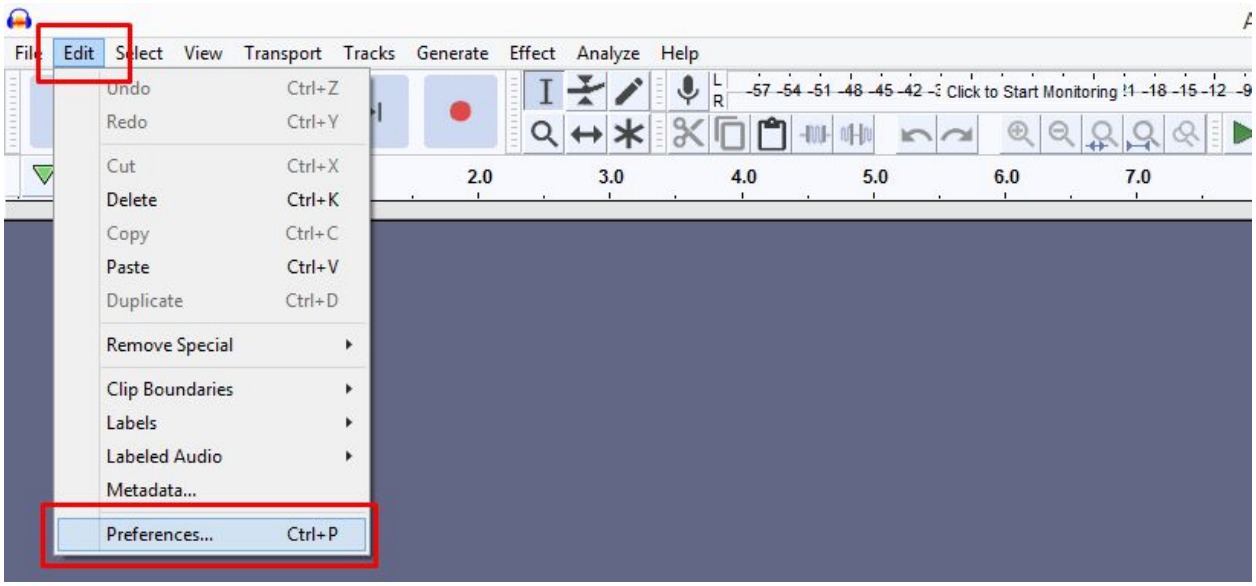
- Audio File Types for Preservation and Access: Resource Guide
- Audio Cassette Digitization: Equipment Purchasing Guide
- Basic Audio Editing Using Audacity: Instructions
- Audio Cassette Digitization: Workflow

Audacity Configuration

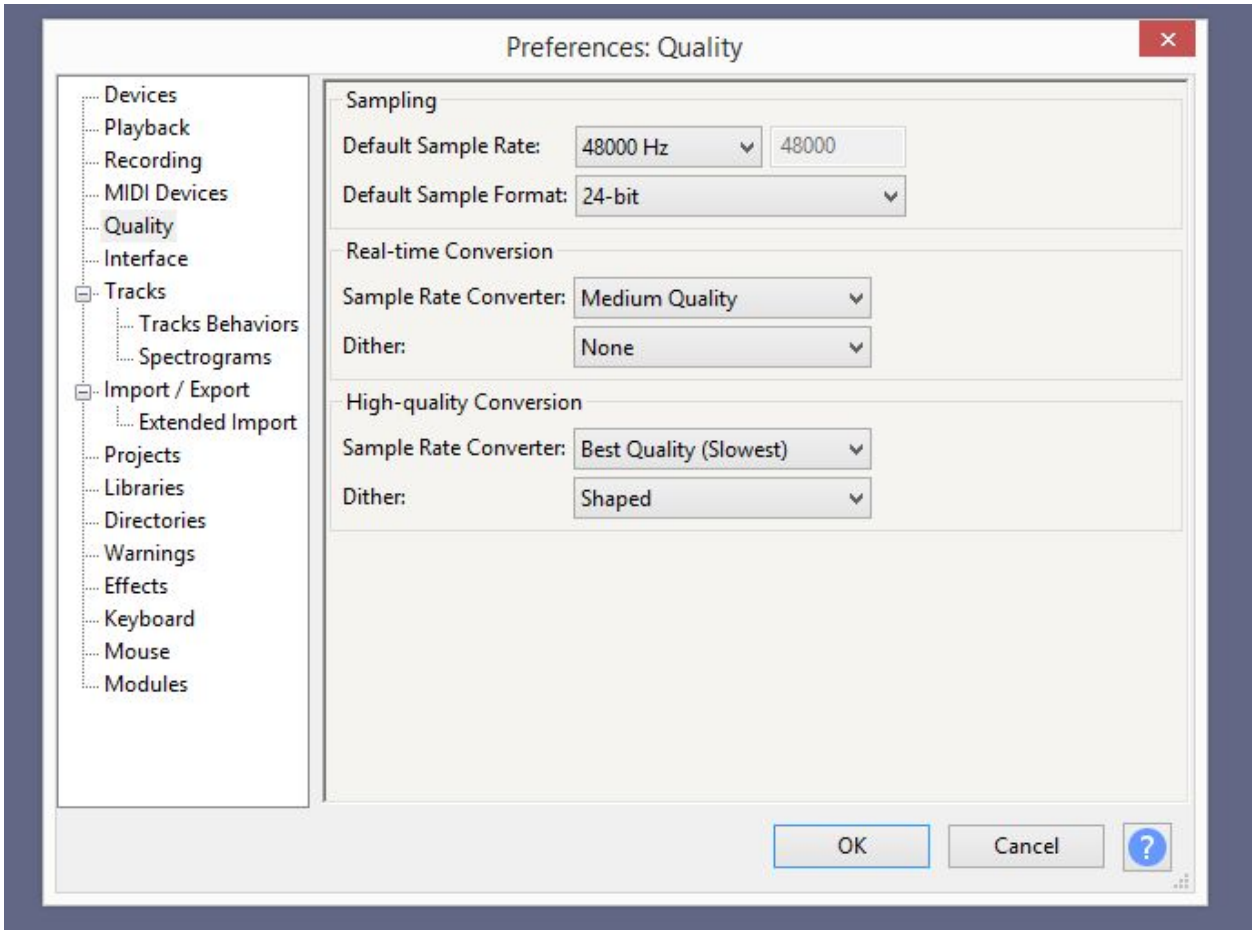
Project Settings

The specific capture settings are affected by project needs and equipment compatibility, among other considerations. These settings should be documented in your project plan. This workflow assumes that capture settings are 48 kHz and 24 bits (which is sufficient for most audio formats - adjust your settings accordingly), and that playback and capture equipment has been properly assembled, installed, and connected. Refer to manufacturer's specifications for assembling and servicing equipment.

1) From the menu, go to **Edit** > **Preferences** (or press Ctrl+P).



2) Select the **Quality** sub-menu. Apply the following settings:
    a) Sampling
        i) Default Sample Rate: **48000 Hz**
        ii) Default Sample Format (bit depth): **24-bit**
    b) Real-time Conversion
        i) Sample Rate Converter: Medium Quality (default setting)
        ii) Dither: None (default setting)
    c) High-quality Conversion
        i) Sample Rate Converter: Best Quality (Slowest) (default setting)
        ii) Dither: Shaped (default setting)

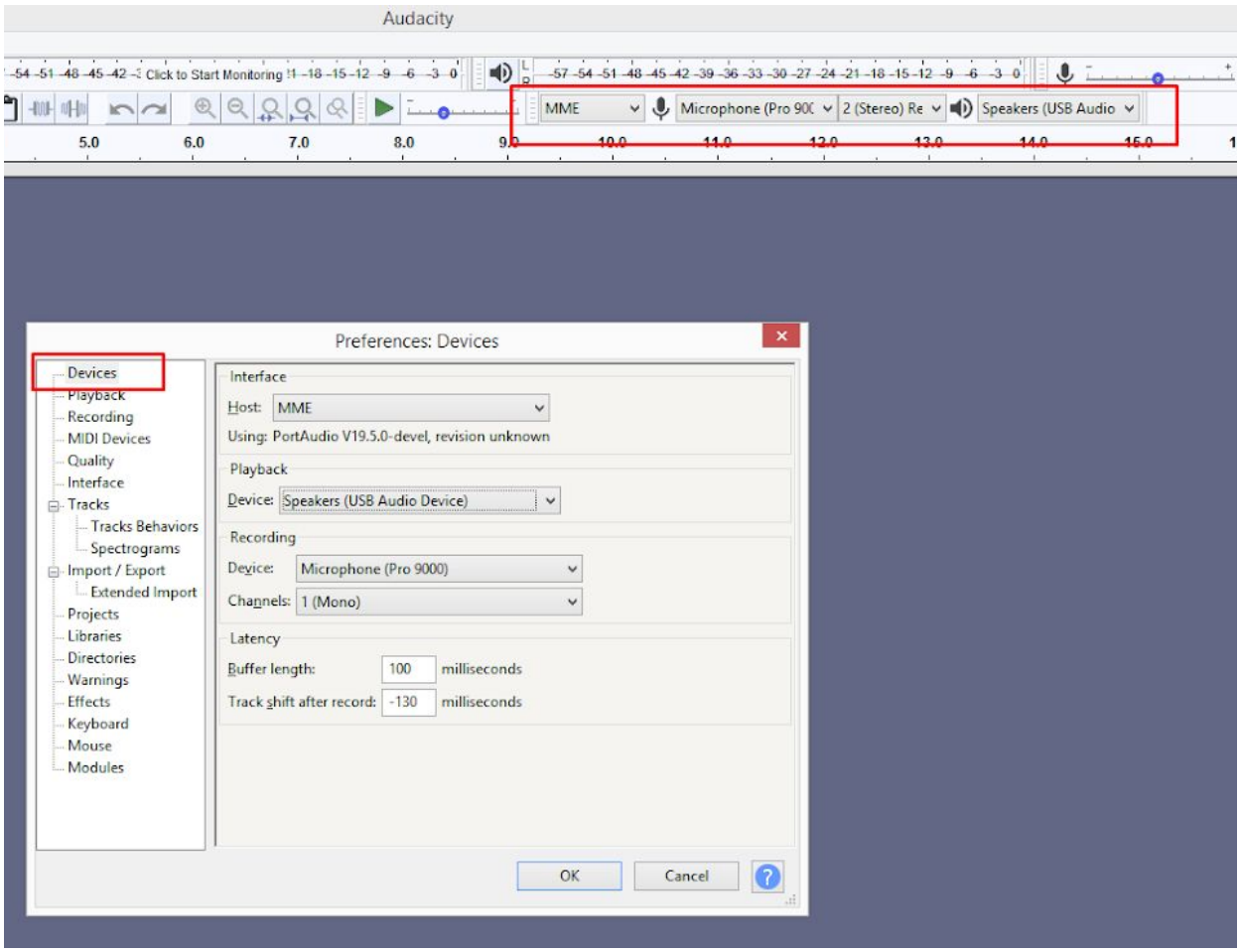


Recording and Playback Settings

1) From the menu, go to **Edit** > **Preferences** (or press Ctrl+P).
2) Select the **Devices** sub-menu. These settings and inputs vary depending on equipment - some trial and error may be required. These can also be accessed in the main editing window.
    a) Interface
        i) Host (The "Audio Host" is the interface between Audacity and the sound device): **MME** (Windows default), **Core Audio** (Mac default), **ALSA** (Linux default)
    b) Playback
        i) Device: The named sound device to which your headphones or speakers are connected. Likely a sound or audio interface device that you have installed. Preferably not a device like Microsoft Sound Mapper that uses the system default device, as this will produce a poorer-quality signal than a dedicated audio interface.

c) Recording
    i) Device: The named audio interface you are using to perform the analog/digital conversion.
    ii) Channels: Most likely **2 (Stereo)**. If the audio turns out to only be a Mono track, it is easy to discard the empty channel before exporting files.

d) Latency
    i) Buffer Length: 100 milliseconds (default setting)
    ii) Track shift after record: -130 milliseconds (default setting)

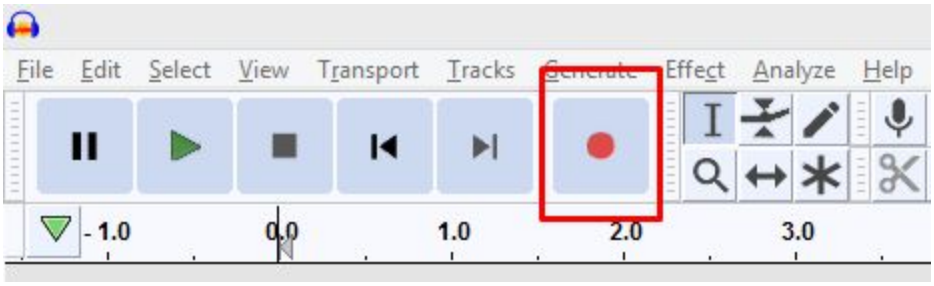


Equipment Settings

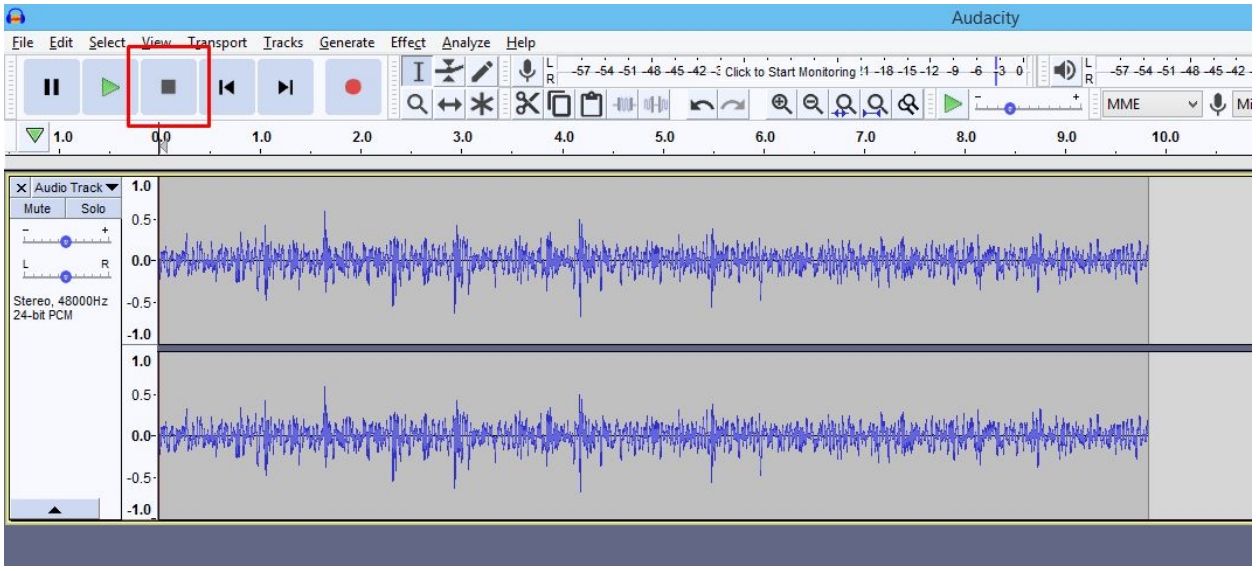
Test Recording Quality and Volume

Before playing and digitizing the recording in full, it's best to capture a shorter section of the recording to check recording quality and settings. Note that if the recordings are especially damaged or fragile, it may be best to only play and record them once, so adjustments may need to be made on the fly.

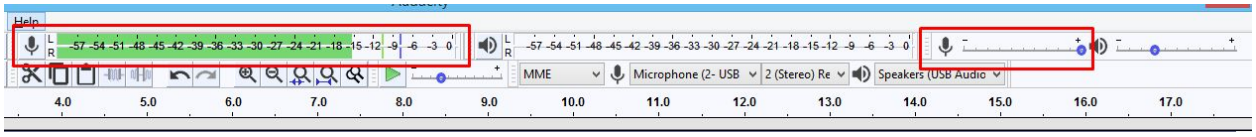
1) Load analog recording into playback device.
2) Press **Record** in Audacity.



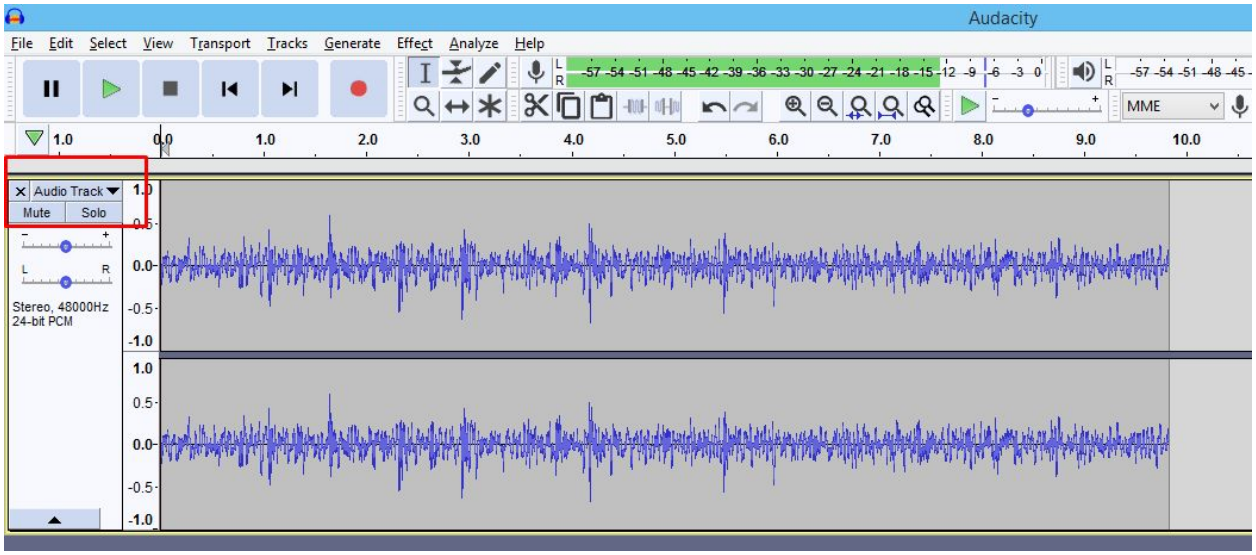
3) Wait a few seconds, then press play on the playback device.
    a) Listen to the audio coming directly from the playback device if it has a headphone or microphone output so you can compare the volume and quality to the Audacity recording.
4) Record a long enough clip to serve as a representative sample.
5) Stop the playback device, then stop the Audacity recording.



6) Listen to the Audacity recording and compare it to the audio coming directly out of the playback device.
    a) The volume should have a maximum peak of around -6.0dB.
    b) Use the **Recording Level** slider (microphone icon) to adjust the input volume. The **Playback Level slider** (speaker icon) does not affect recording levels, only the output to speakers/headphones.
    c) It is better to have the recording come in slightly quieter than have it max out of 0dB. Levels above 0dB will be clipped, and the audio will be distorted.



7) Once levels are adjusted, rewind the recording, and prepare to digitize it completely.
8) Discard the recording test from Audacity.



DIGITIZATION

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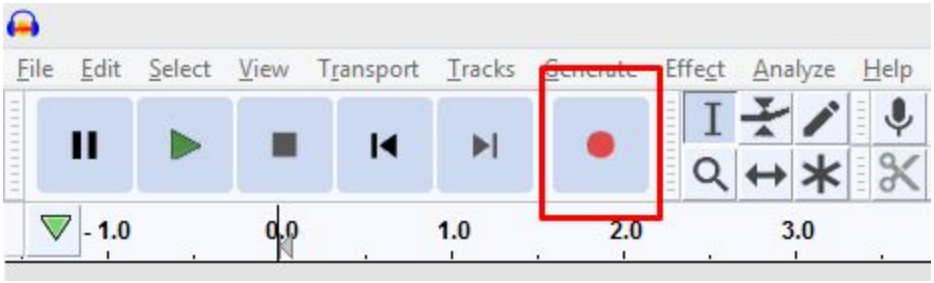
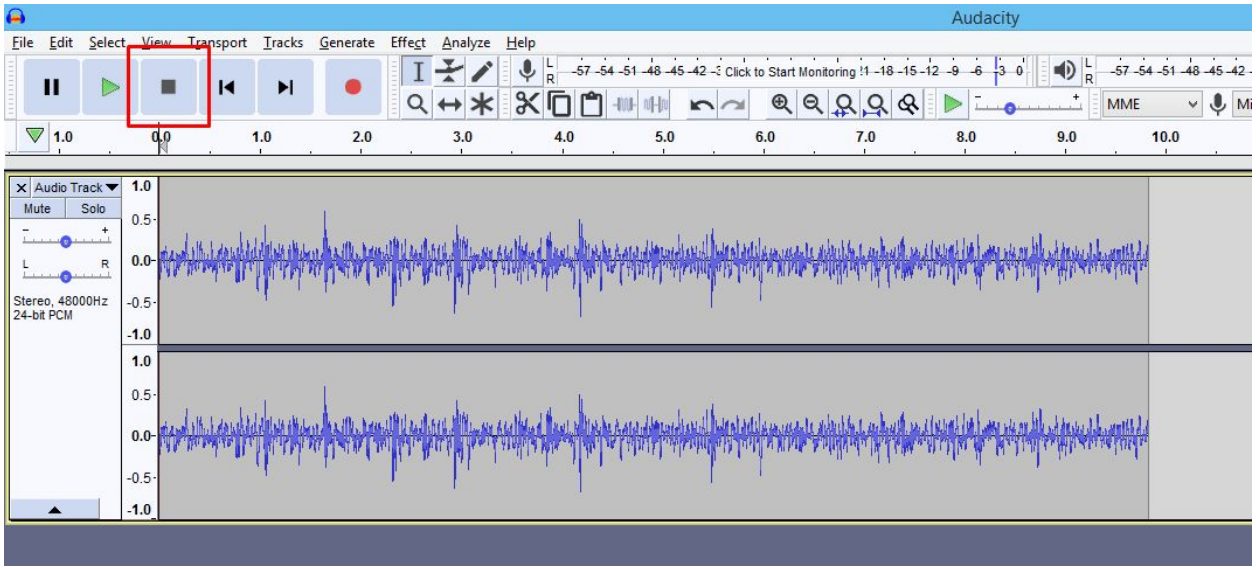
2) Press **Record** in Audacity.



3) Wait a few seconds, then press play on the playback device (this extra silence can be removed later).
4) When the recording is finished, wait a few seconds, then stop the Audacity recording (this extra silence can be removed later).



5) Export (see below).
6) Repeat on other side of recording media if applicable.

Quality Control

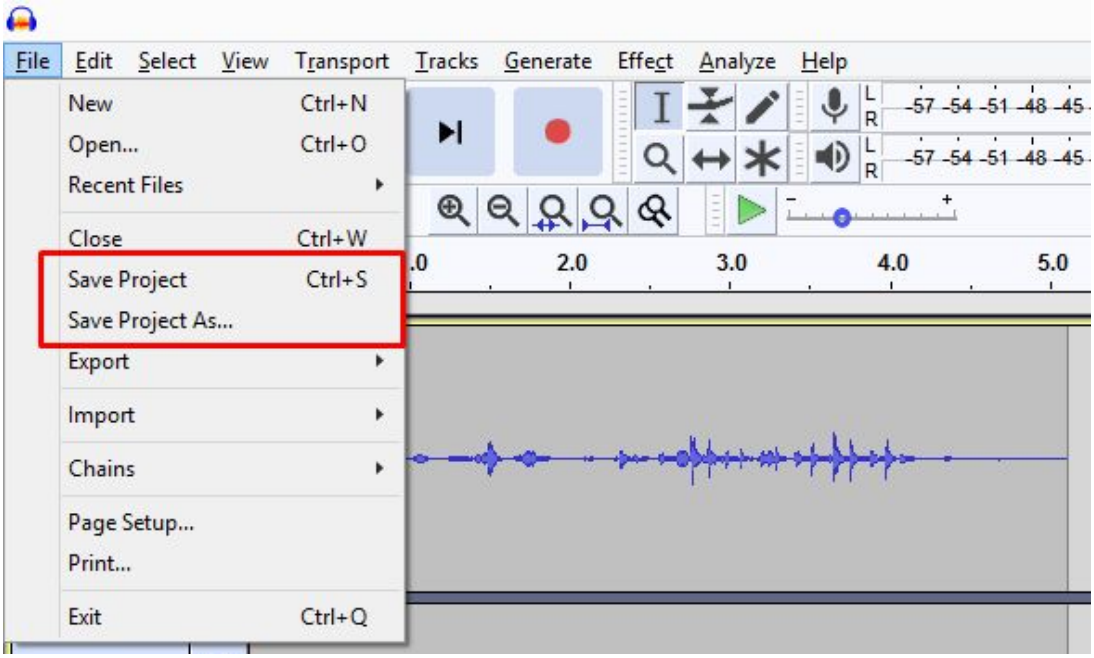
Listen to selections of the recording and spot check quality of recording.

Exporting

Audacity has two similar commands that can be confusing: *Save* and *Export.* Saving produces AUP files which are not sound files and are only used within Audacity to construct a project from provided sound files. AUP files are useful if a user needs to preserve the individual edits in a project, or needs to stop a project in the middle of editing and continue at a later time. Exporting produces audio files in a range of file formats suitable for use elsewhere (eg: MP3, WAV), and is used to produce preservation and access files.

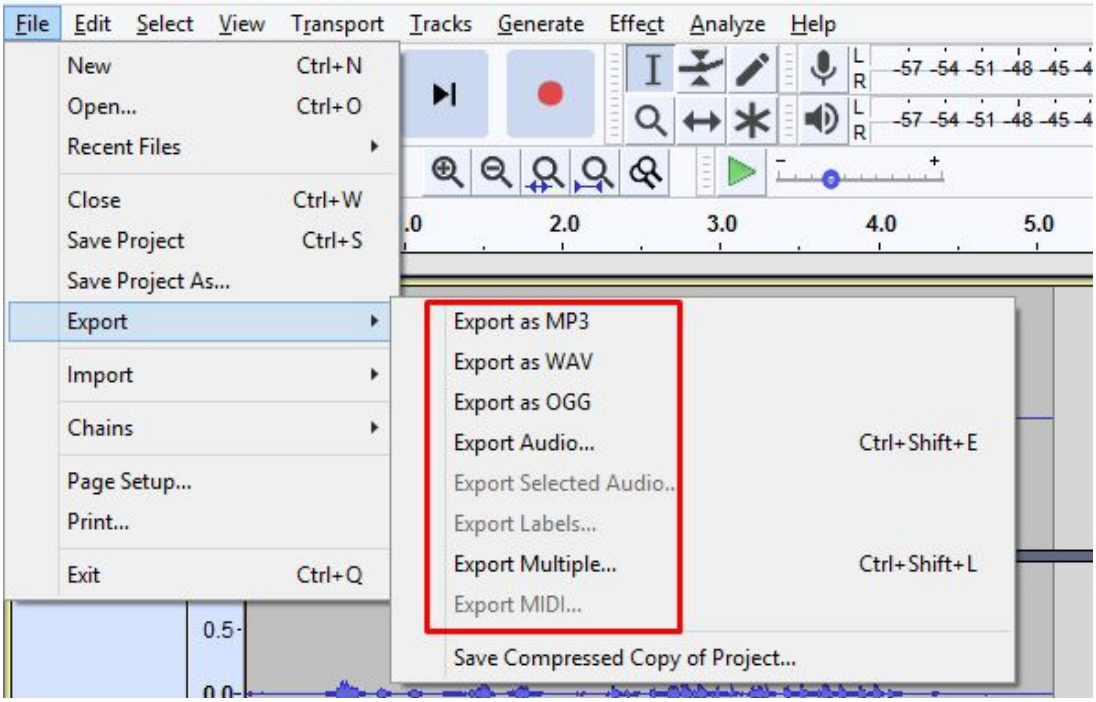
Save Audacity Project File (AUP)

1) From the menu, go to **File** > **Save Project**

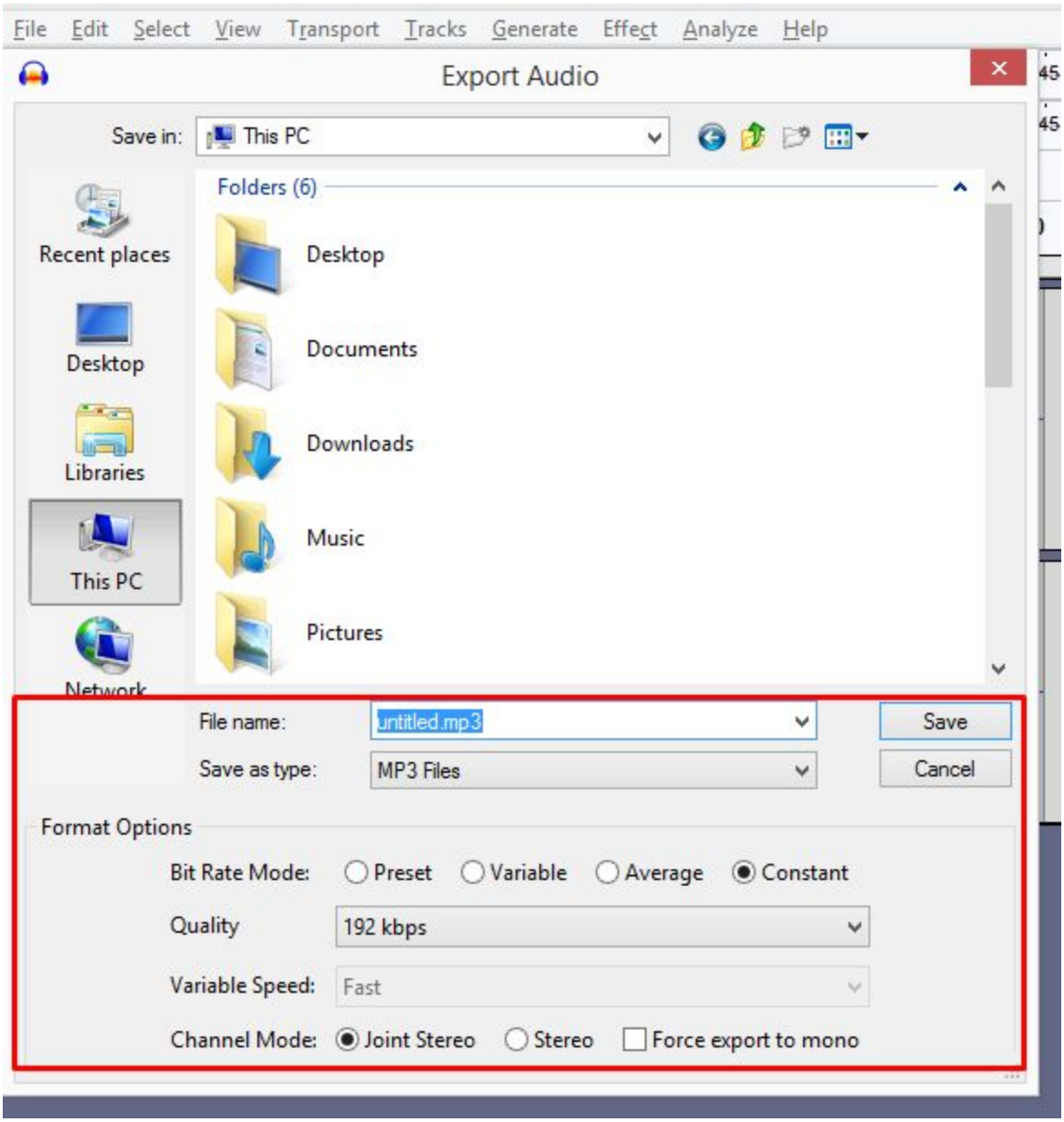


Export audio file

1) From the menu, go to **File** > **Export** > **Export as (filetype)**



2) Refer to project documentation when selecting export format and file options.



Additional Resources

Audacity is a well-established tool with an expansive user base and many helpful resources available online.

- Audacity User Manuals: https://www.audacityteam.org/help/documentation/
- Audacity Wiki: https://wiki.audacityteam.org/wiki/Audacity_Wiki_Home_Page
- Audacity Forum: https://forum.audacityteam.org/