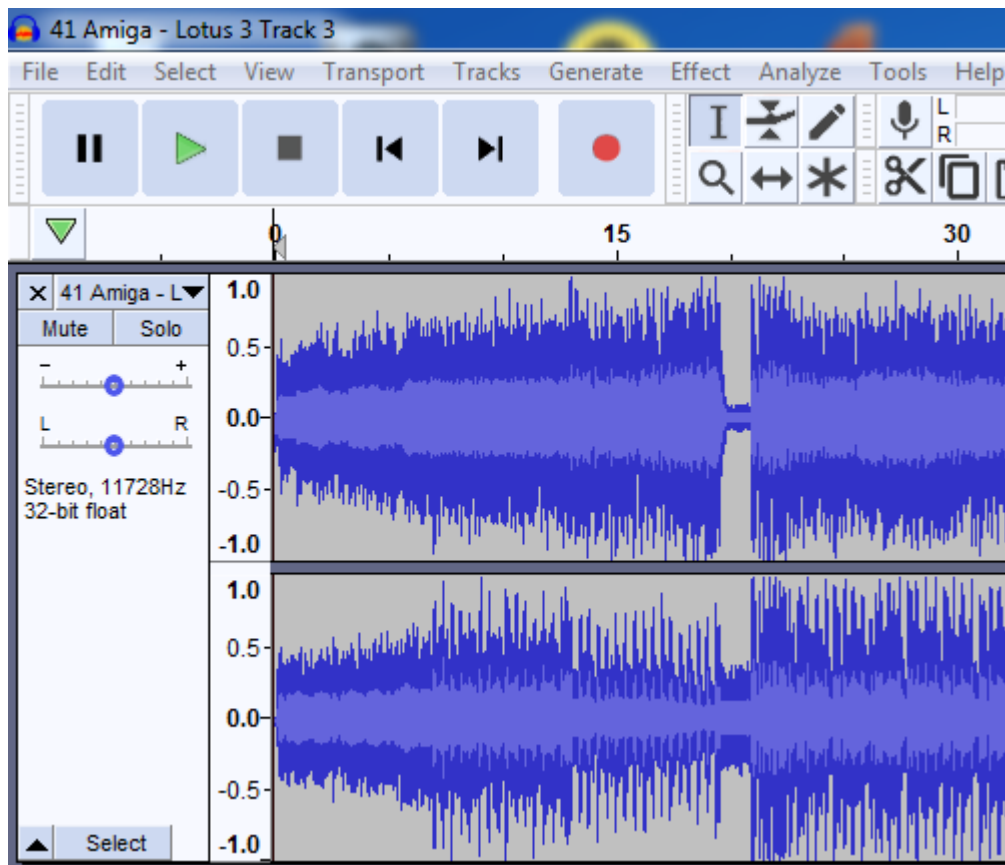


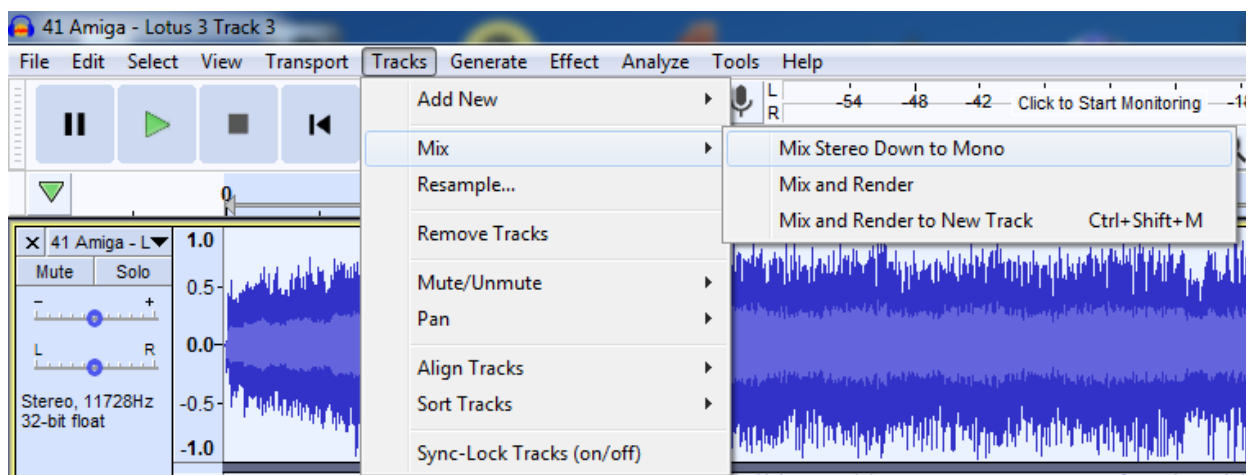
# How to convert a music file for Breadamp using Audacity 2.3.2

(note: some words are in German in the screenshots as I use a German computer)

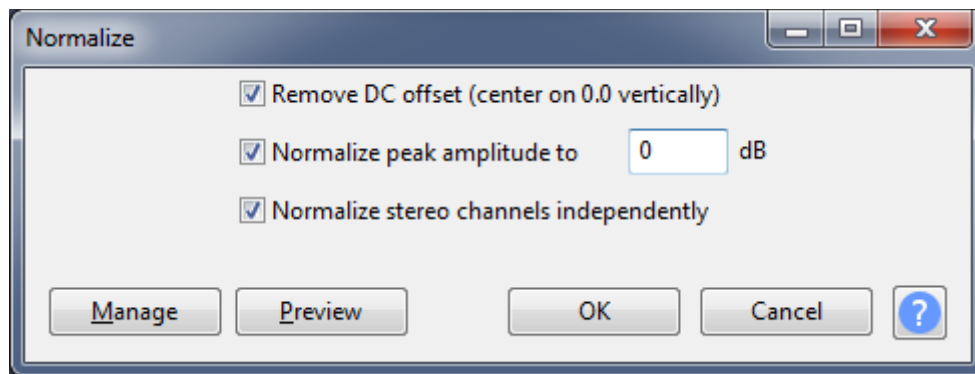
1. Open the music file you want to convert using the menu „File“ → „Open...“ or by dragging the music file into the audacity window. Audacity supports the following input file types: wav, mp3, ogg and flac (and maybe some more using ffmpeg). You should now see the waveform of the music file:



2. If the source file is stereo and you want to convert the file to a stereo file proceed with step 4.
3. If the source file is stereo and you want to convert the file to a mono file use the command in the menu „Tracks“ → „Mix“ → „Mix Stereo Down to Mono“

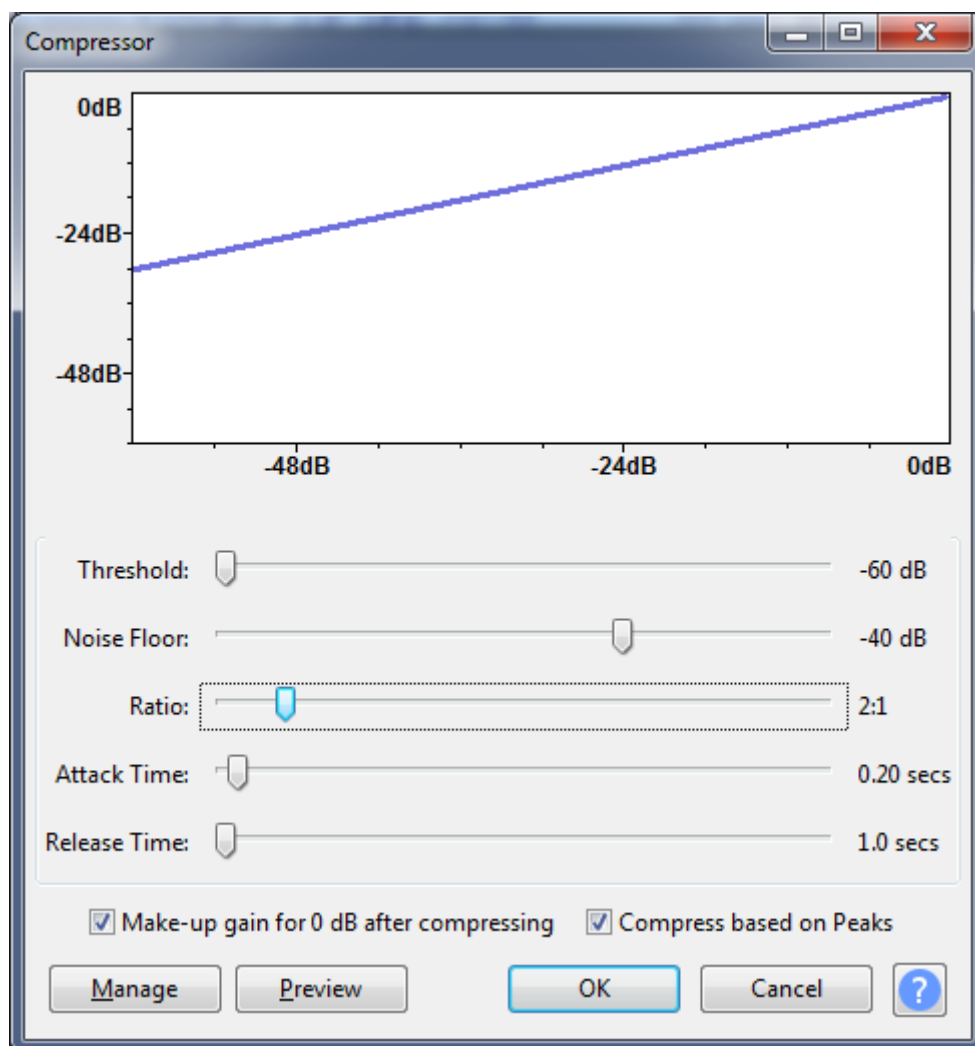


4. Optional: you can improve the audio quality by normalizing or compressing the audio to „make it louder“ in order to use the entire 8 bit resolution on the C64. To apply normalization use the menu „Effect“ → „Normalize...“, set it this way:



and click on „OK“.

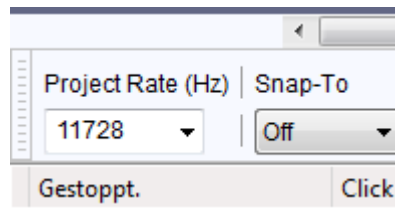
If you have a track with very unequal loudness or very quiet parts it may improve the sound quality on the C64 by applying the compressor using the menu „Effect“ → „Compressor...“. The following settings apply a gentle compression. You can set it higher by increasing the Ratio, but it may suppress some elements of the music too much.



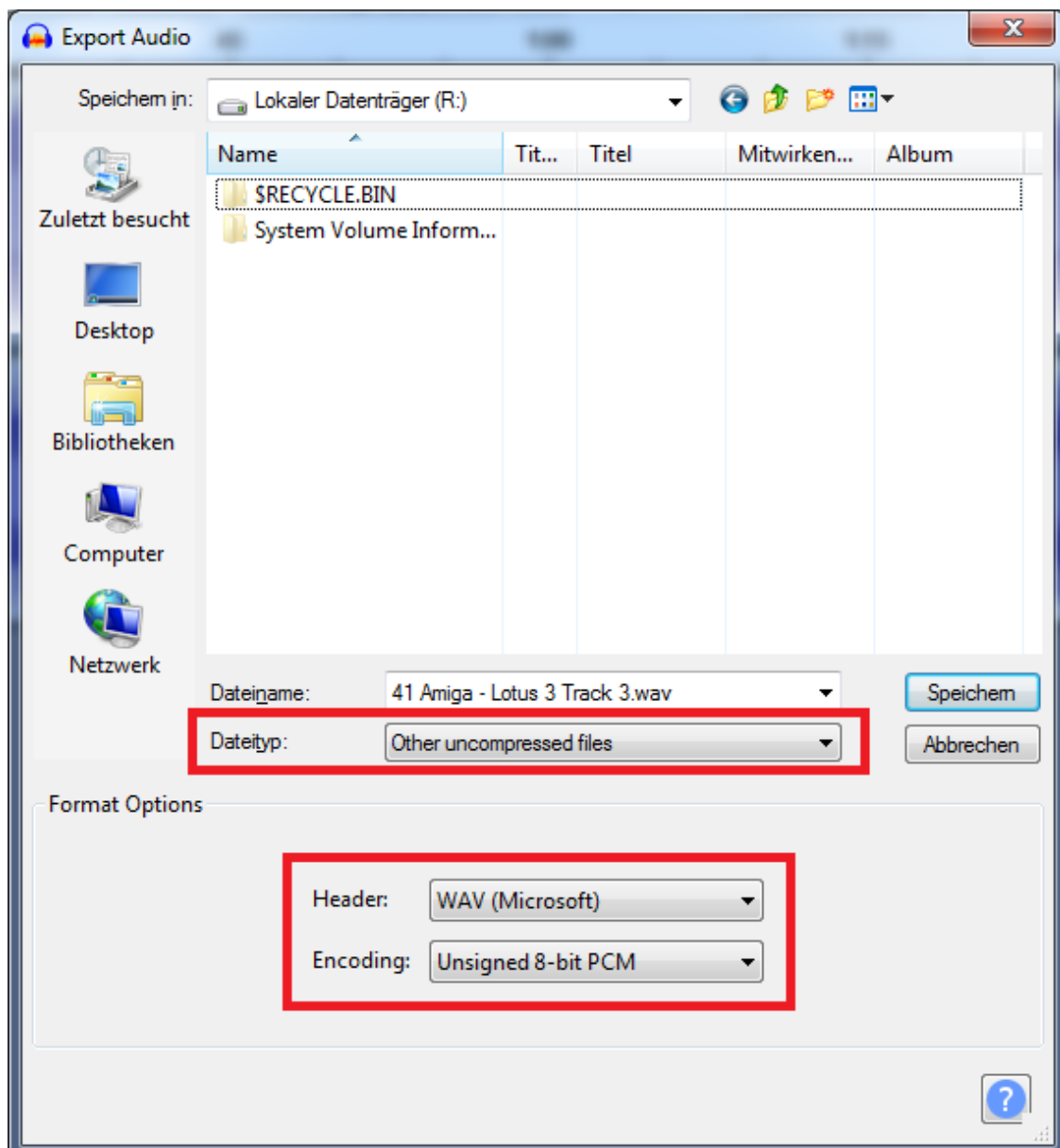
Click OK to apply the compression.

(note: the compressor also normalizes the sound so it is not necessary to apply normalize if you use the compressor)

5. Change the Project Rate (Hz) to a supported sample rate (for example 11728 Hz) using the Numpad.  
For supported sample rates refer to the file „Breadamp v03 Tonformate.pdf“ in the archive.



6. Export the file using the menu „File“ → „Export“ → „Export audio...“ and the following settings:  
(if you want to convert the music into an Ultimate Audio 16 bit format you have to set the Encoding to “Signed 16-bit PCM”)

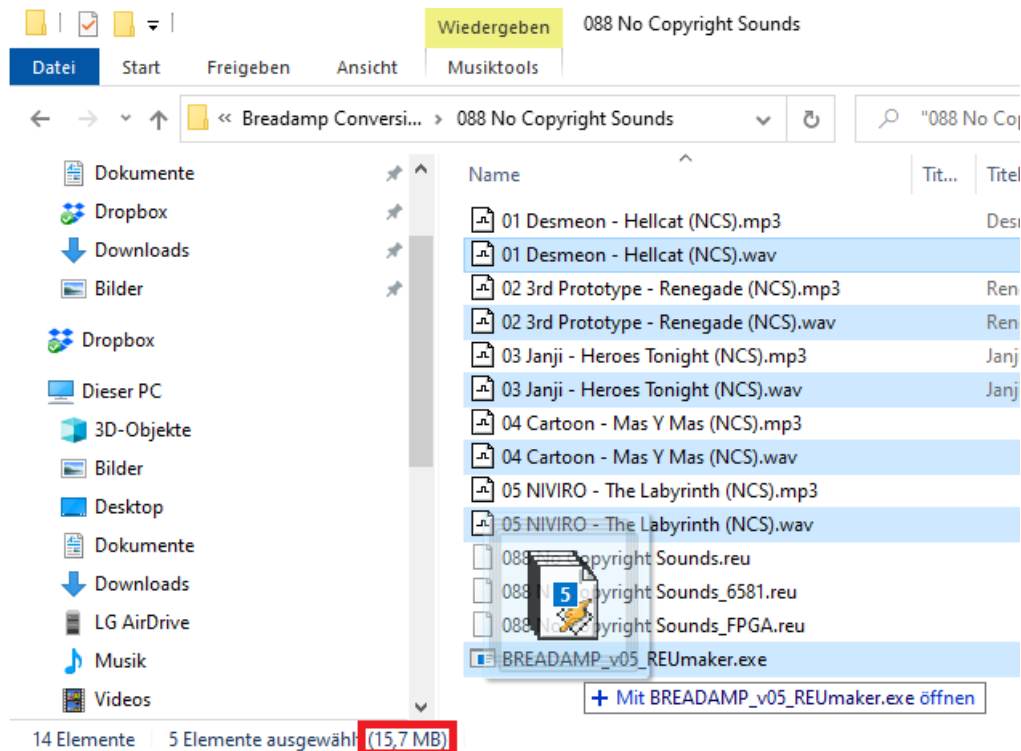


Click on „Save“ and „OK“ in the next dialogue. Your music file is now converted for use with the BREADAMP\_v05\_REUmaker.

If you want to convert more music files repeat all steps until you have converted all files.

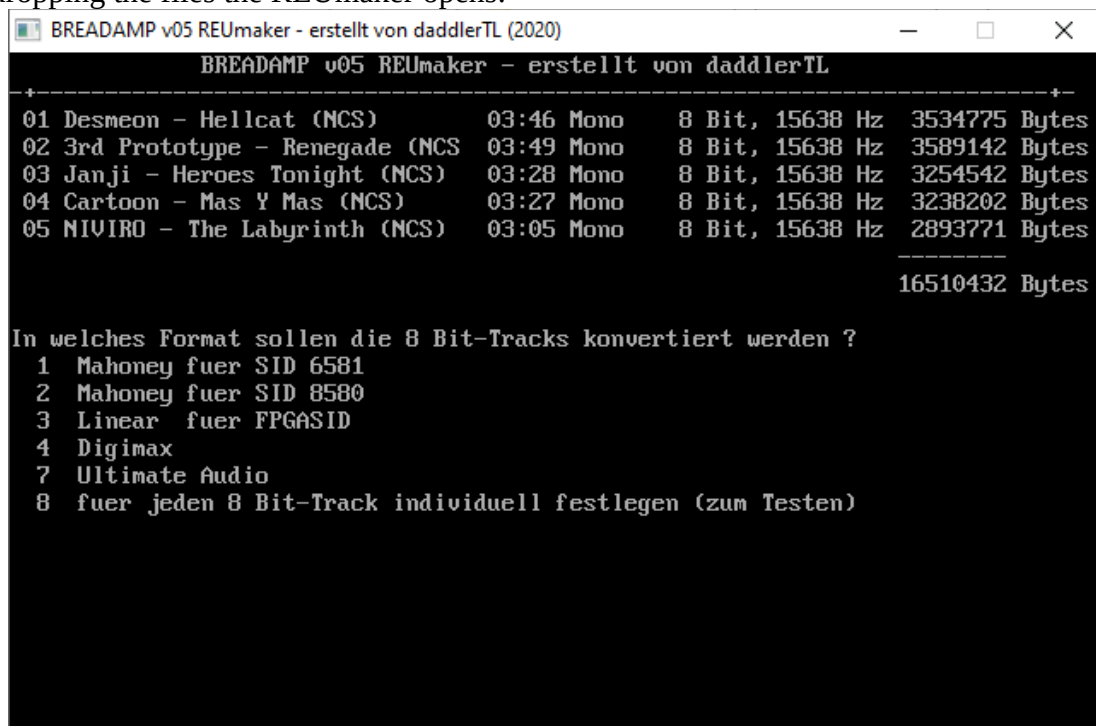
# Compilation of a REU file using the Breadamp-REUmaker

To create a reu file you have to select all desired wav files which were created with Audacity using the Windows Explore and drag and drop them onto the BREADAMP\_v05\_REUmaker.exe:



To select multiple files hold down the Ctrl key. The maximum allowed combined file size of all files is 16 MiB if a conversion to 8 or 16 bit and 32 MiB if a conversion to 4 bit is wanted (the Windows Explorer should show 15,9 respectively 31,9 MB maximum to be safe).

After dropping the files the REUmaker opens:



If the wav files are correct and are converted to sample rates only suitable for 8 bit conversion the menu shown above is displayed.

Here you just have to select for which audio output device you want to convert the music using the corresponding number keys.

After that the conversion starts. This takes approximately 1 minute (depending on the PC / laptop you use it may be quicker or slower).

When the conversion is finished the following message should appear:

```
BREADAMP v05 REUmaker - erstellt von daddlerTL (2020)
03 Janji - Heroes Tonight (NCS) 03:28 Mono 8 Bit, 15638 Hz 3254542 Bytes
04 Cartoon - Mas Y Mas (NCS) 03:27 Mono 8 Bit, 15638 Hz 3238202 Bytes
05 NIVIRO - The Labyrinth (NCS) 03:05 Mono 8 Bit, 15638 Hz 2893771 Bytes
-----
16510432 Bytes

In welches Format sollen die 8 Bit-Tracks konvertiert werden ?
1 Mahoney fuer SID 6581
2 Mahoney fuer SID 8580
3 Linear fuer FPGASID
4 Digimax
7 Ultimate Audio
8 fuer jeden 8 Bit-Track individuell festlegen (zum Testen)

konvertiere Track 1 ... 3534775 Bytes konvertiert
konvertiere Track 2 ... 3589142 Bytes konvertiert
konvertiere Track 3 ... 3254542 Bytes konvertiert
konvertiere Track 4 ... 3238202 Bytes konvertiert
konvertiere Track 5 ... 2893771 Bytes konvertiert

Konvertieren beendet.
Die Datei BREADAMP_8580.reu
kann nun mit BREADAMP v05 oder hoeher abgespielt werden.

Press any key to continue
```

Now you can play the created reu file (can be found in the same folder as the source wav files) using Breadamp.

If the wav files were created with a sample rate of 7819 Hz or 5864 Hz (for PAL) in mono they can also be converted to 4 bit. The converter offers a selection menu for that:

```
BREADAMP v05 REUmaker - erstellt von daddlerTL
+-----+
01 Aquarius-It Feels Like Summer 05:45 Mono 4 Bit, 7819 Hz 1350817 Bytes
02 Army Of Lovers-Lit De Parade 07:42 Mono 4 Bit, 5864 Hz 1356274 Bytes
03 Yello-How How 05:50 Mono 4 Bit, 5864 Hz 1026933 Bytes
>04 Mark Oh-Tears Don't Lie 04:57 Mono 8 Bit, 7819 Hz 2322543 Bytes<
05 Ororo-Zombie 05:49 Mono 8 Bit, 7819 Hz 2734314 Bytes
06 Moby-Feeling So Real 04:29 Mono 8 Bit, 5864 Hz 1580226 Bytes
-----
10371107 Bytes

Mit Cursor hoch/runter zum naechsten einstellbaren Track springen
Mit Cursor links/rechts zwischen 8 und 4 Bit wechseln
Mit Enter Einstellung beenden und mit Konvertierung fortfahren
```

Using the arrow keys up and down you can select the track and using left and right you can switch between 8 bit and 4 bit.

If the target file size is too big it will be shown by displaying a red number. In this case you have to reduce more tracks to 4 bit until no red number is displayed any more.

If all desired settings are done press the enter key.

Now either the conversion is directly started (if all tracks are to be converted to 4 bit) or the menu to select the SID type is displayed.

### **Possible errors:**

#### Windows error message after the start of the REUmaker:

Files were selected that crashed the REUmaker. This happens when a file has additional dots in the file name (not only the one that separates the file name from the extension) or a wav file was created using a program that created a non standard header.

```
Eingabedatei ist keine Standard-Wave-Datei !  
Fehlerhafte Datei: 01 Desmeon - Hellcat (NCS).mp3
```

This error occurs if you drag and drop an unsupported file onto the REUmaker, for example a mp3 file.

```
Es werden nur folgende Sampleraten unterstuetzt:  
PAL: 15638 / 11728 / 7819 / 5864 Hz  
NTSC: 15734 / 7867 Hz  
Ultimate Audio: wie PAL / NTSC und 22050 / 32000 / 44100 / 48000 Hz  
Fehlerhafte Datei: falsche Samplerate.wav
```

A wav file was created using an unsupported sample rate. This error message also occurs if you mix sample rates for PAL and NTSC (if the first file has a valid sample rate for NTSC the supported sample rates for NTSC are displayed).

```
Es werden nur Wavedateien mit 8 oder 16 Bits/Sample unterstuetzt !  
Fehlerhafte Datei: Donkey Kong Country 2 Guitar Medley 24bit.wav
```

A wav file has an unsupported number of bits per sample, e.g. 24. The files have to be converted to “Unsigned 8-bit PCM” (or “Signed 16-bit PCM” for Ultimate Audio 16 Bit – Tracks) (see step 6 of the conversion instructions).

```
Gewaehlte wav-Datei(en) sind zu lang, Konvertierung nicht moeglich.  
Bitte weniger bzw. kuerzere wav-Datei(en) waehlen.
```

The amount of data is too large to fit the music into a 16 MiB reu file. It is also accounted that wav files with 7819 Hz or 5864 (for PAL) can be converted down to 4 bit which means that the error message is not displayed if the total size of the wav files is larger than 16 MiB but the size can be reduced to less than 16 MiB by converting to 4 bit.

Note: only the first recognized error is displayed even if multiple errors are present.

### Messages of the converter (no error messages):

**Alle Tracks werden ins Ultimate Audio – Format konvertiert.**

The formats of all wav files are only supported by Ultimate Audio. The converter immediately starts converting to the Ultimate Audio format, because a dialogue for the desired format would make no sense in this case.

**16 Bit-Tracks werden ins Ultimate Audio – Format konvertiert.**

16 bit tracks are only supported by Ultimate Audio and are therefore always converted to the Ultimate Audio format. If the format selection dialogue appears, the selected format is applied only to the 8 bit tracks with sample rates that are not exclusively supported by Ultimate Audio. If all wav files are stored in the 16 bit format, the message „Alle Tracks werden ins Ultimate Audio – Format konvertiert.“ will be displayed.

**PAL- und NTSC-Sampleraten in den wav-Dateien entdeckt.  
Diese Mischung wird nur von Ultimate Audio unterstuetzt.  
Alle Tracks werden ins Ultimate Audio – Format konvertiert.**

If you drag and drop wav files with a mix of PAL and NTSC sample rates the converter can only convert your music to the Ultimate Audio format, because the mix of PAL and NTSC sample rates can only be played back properly by Ultimate Audio.