

TUTORIAL: Generating RAW Data for AudioSpectro FIRE

Note: Generating raw data is very quick and easy.

Please follow the instructions very carefully in this text-based tutorial to ensure data integrity.

You also can refer to this YouTube video tutorial on generating raw data if there are unclear items on the steps:

<http://www.youtube.com/watch?v=VI0zxEbQE4>

REQUIREMENTS:

- a.) Audacity (latest version) - download and install this open-source software:

<http://audacity.sourceforge.net/download/>

For the version 1.2 of this tool, it is tested to work with Audacity 2.0.0 and Audacity 2.0.2.

This is tested under Windows operating system.

- b.) LAME MP3 encoder library installed in Audacity.

Follow the installation steps:

1.) Make sure Audacity is installed first in your computer.

2.) Go to this URL (copy and paste in the browser address bar):

<http://lame1.buanzo.com.ar/#lamewindl>

3.) Download the LAME MP3 encoder library depending on the operating system used.

For example, for Windows operating system.

Click the link under "For FFMpeg/LAME on Windows" to download the installer.

See the screenshot (enclosed in red box):

For FFMpeg/LAME on Windows:

[Lame v3.99.3 for Windows.exe](#)

Please support this download server.

4.) After downloading, double-click the installer and proceed to installation.

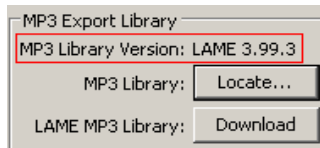
Use the default installation path provided by the installer.

5.) Launch Audacity, go to Edit --> Preferences --> Libraries.

6.) Click "Locate" and browse through the installed path

(usually C:\Program Files\Lame For Audacity\lame_enc.dll) under "Program Files" in Windows; then select lame_enc.dll. Click OK.

7.) To check if you have successfully added the library, you should be able to find the MP3 library version such as the one shown below (inside the red box):



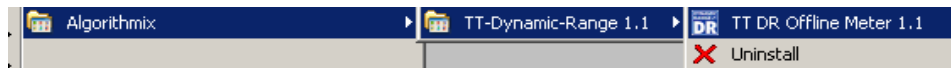
- b.) TT Dynamic range meter- open this page in the browser and scroll down:

<http://www.dynamicrange.de/es/es/download>

For Windows: download "TT-DR-Install.exe".

For Mac: <http://www.mediafire.com/?xzq2o9bpn84n5qz>

After installation, you can view the program like this (e.g. in Windows XP --> Start --> All Programs)



- c.) (OPTIONAL) Voxengo R8brain sample rate converter

(if the source audio to be analyzed is not using 44100Hz as the sample rate).

STEPS IN GENERATING RAW DATA:

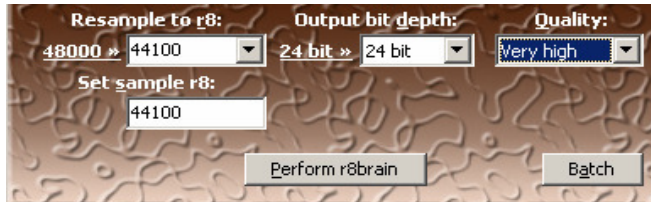
- 1.) Launch Audacity, go to File --> Open. Locate your 24-bit/44100Hz stereo audio WAV file in your computer. Make a backup of this mix down file in advance to prevent from accidental overwriting.

If you see a warning, just select "Make a copy of the files before editing (safer)" as the Import method.
This high resolution audio wav file is either:

- a.) A raw stereo mixdown from audio mixing.
- b.) A high resolution output of your mastering process.

If the sample rate is not 44100Hz (e.g. 48000Hz or 96000Hz); you should convert it to 44100Hz using
Voxengo R8brain: <http://www.voxengo.com/product/r8brain/>

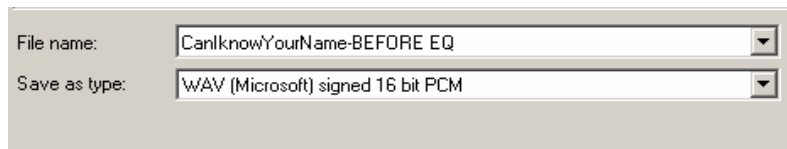
Example settings in R8brain for converting a 48KHz mixdown to 44.1KHz, bit depth should be left unchanged:



Screenshot below after adding the WAV file to Audacity:

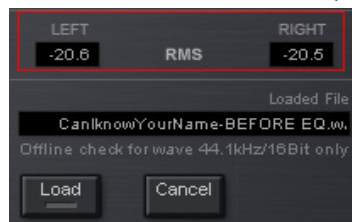


- 2.) After loading the file in Audacity, go to File -- > Export. In the "Save as type", select "WAV (Microsoft) signed 16-bit PCM".



Save the exported 16-bit WAV file to your Desktop with the same filename.
This file will be used for adjusting the volume of your track to -20dB RMS.

- 3.)Launch TT Dynamic range meter offline mode.
Go to Start -- > All Programs -- > Algorithmix -- > TT-Dynamic-Range 1.1 -- > TT DR Offline Meter 1.1
Click "Load" button and locate the exported 16-bit WAV file in your Desktop then click "Open" to load the file.
TT Dynamic range meter automatically calculates the track loudness in dB RMS.
See the screenshot (in red box):



There should be two values since the mix down file is in the stereo format.
For example, it shows -20.6dB and -20.5dB as the RMS values.

- 4.)Calculate the needed volume adjustment by entering the RMS total loudness dB data for both LEFT and RIGHT channels . This is the adjustment to normalize the loudness of your track to -20dB RMS.

Go to "My Volume Adjustment" sheet to enter the results.

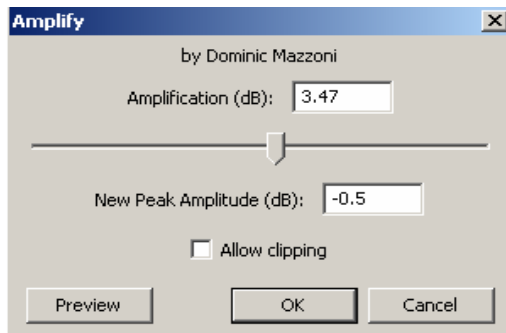
My Volume Adjustments Table

*** Note: Enter values only in yellow cells. This is the data coming

Enter the RMS total loudness dB L:	Enter the RMS total loudness dB R:	Recommended dB adjustment:
-20.6	-20.5	3.47

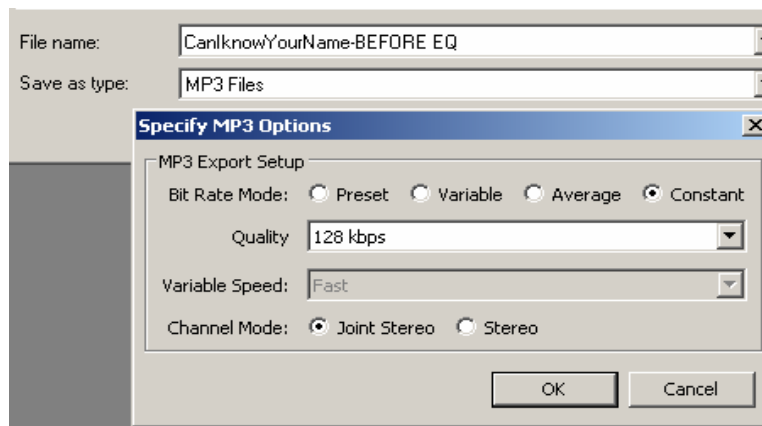
In the above result example, the recommended dB adjustment is +3.47dB.

- 5.) Launch Audacity again and open the high resolution mix down WAV file (e.g. 24-bit/44.1KHz).
Go to Effect --> Amplify.
Enter the recommended dB adjustment in the "Amplification (dB)"
For example (using the +3.47dB adjustment as illustrated previously):
Don't enter anything on "New Peak Amplitude (dB)". Leave it as default.



Click OK to implement the setting.

- 6.) In Audacity. Go to File --> Export. In the "Save as type", select "MP3 Files" then click "Options".
Set the following options:
Bit rate mode: "Constant"
Quality: "128kbps"
Channel Mode: "Joint Stereo"



**Note: 128kbps MP3 is used as the target file type since the computing algorithm uses this format for generating test specification.

Finally click OK and then click "Save" the file to your Desktop or any folder you like.

- 7.) Then in Audacity, you need to open this converted MP3 file. Go to File --> Open, locate the rendered 128kbps MP3 file in the previous step. Then go to Analyze --> Plot Spectrum.

Set it as follows:

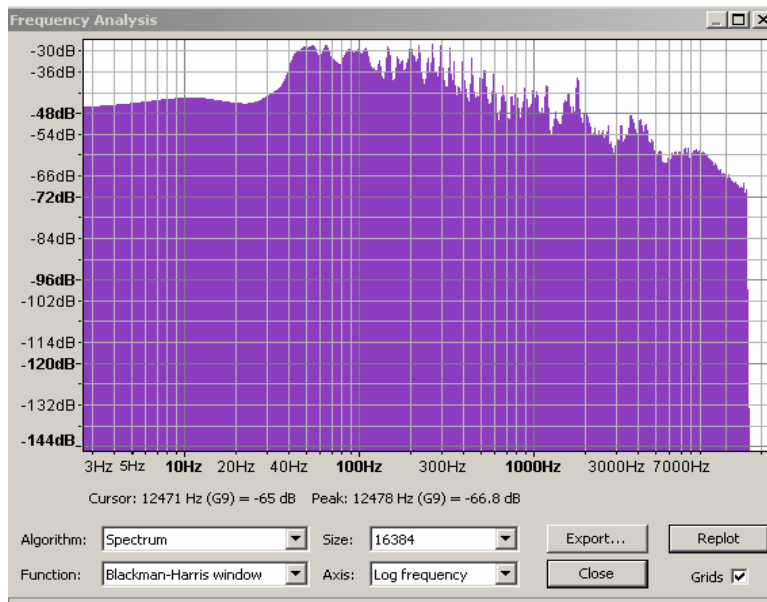
Algorithm: Spectrum

Function: Blackman-Harris window.

Size: 16384

Axis: Log Frequency

Click "Replot".



- 8.) Click "Export" button. Assign a name of the raw data file, e.g. raw_data.txt. Make sure it uses .txt file extension. Save it to your Desktop or any convenient location in your computer to access.
- 9.) You have successfully generated your raw data. Exit Audacity. Don't save any changes. Now open the exported raw data with Notepad. Go to Edit --> Select all. Then Go to Edit again --> Copy.

- 10.) Paste the raw data in the tool "STEP1.) RAW DATA" Sheet.

(Right clicking on Cell A1 then paste).