Setting up the UMI-1 with REW

Is there an easier way? Sure. There are lots of options for a single purpose device that will allow you to make frequency response measurements of audio systems. The benefit of a closed system (a hand-held) is that it's already calibrated. You turn it on and you're ready to go. That's an attractive option, but it often comes at a much higher cost.

The benefit of using a PC/Mac is that the software available is often much more powerful and can display the information in several formats. Once you have some experience, you'll find that being able to store and analyze measurements is a valuable feature, especially if tuning audio systems is part of your profession.

We've designed this kit to be a convenient way to get all the parts you need to make accurate frequency response measurements of car audio systems without the hassle of

figuring out what to buy, how it works together and how to calibrate all of it for use with your favorite analysis program.

How this works.

Another benefit of PC test gear is that instead of the accuracy of measurements being dependent on the perfect accuracy of a microphone or a soundcard, we can use the processing power of the PC to remove the frequency response of our test rig and to compensate for the frequency response of the microphone, so long as we know what that frequency response is. That's what the microphone calibration file is for.

If you follow these instructions, you'll be able to make frequency response measurements that are just as accurate as the ones you might make with a lab-grade measurement

tool costing much more.

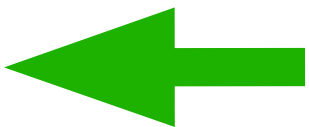
The frequency response of the sound card that's included should be removed from the measurement. Room EQ Wizard makes this simple. Using a calibration routine, you'll make a measurement of the sound card with its input connected directly to its output. Then, the program will store that measurement as a "calibration" file and subtract that frequency response from every measurement you make. If you perform the calibration correctly, your measurements will be super accurate.

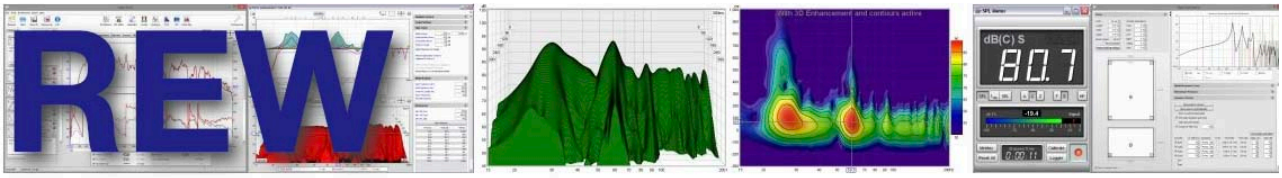
The frequency response of the microphone can also be removed from the measurement in the same way. Both Room EQ Wizard and True RTA provide a way to store the fre#quency response curve of the microphone (your calibration file) and also subtract it from each measurement you make.

So, if accuracy is important, then it's a good idea to follow these instructions to set up your kit. You'll only have to do this once.

This guide is for version 5.20.13

Step 1. Download Room EQ Wizard at www.roomeqwizard.com and follow the instructions to install the program. It is recommended to restart your computer after install.





REW Downloads Equipment Donations Upgrades Features EULA History Help Reading Videos Links Beta Forum

Room Acoustics Software

REW is free software for room acoustic measurement, loudspeaker measurement and audio device measurement. The audio measurement and analysis features of REW help you optimise the acoustics of your listening room, studio or home theater and find the best locations for your speakers, subwoofers and listening position. It includes tools for generating audio test signals; measuring SPL and impedance; measuring frequency and impulse responses; measuring distortion; generating phase, group delay and spectral decay plots, waterfalls, spectrograms and energy-time curves; generating real time analyser (RTA) plots; calculating reverberation times; calculating Thiele-Small parameters; determining the frequencies and decay times of modal resonances; displaying equaliser responses and automatically adjusting the settings of parametric equalisers to counter the effects of room modes and adjust responses to match a target curve.

The Pro upgrade offers simultaneous measurement of multiple inputs with rms averaging, adjustable weighting for each input, level alignment, and up to 16 input traces on the RTA in addition to the rms average.

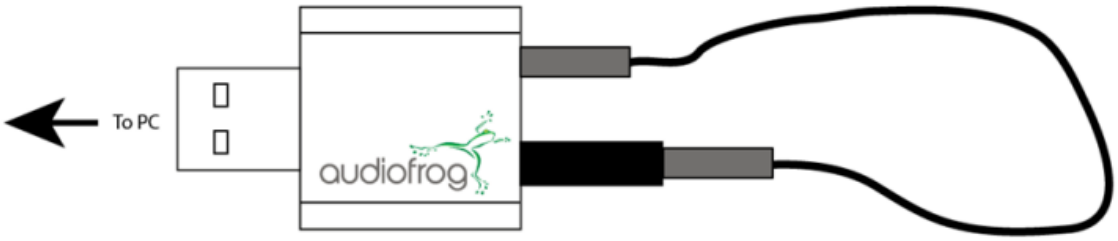
Downloads

The current version is V5.20.13, revised 26th September 2022. If you are looking for V5.19 it is here.
V5.19 cannot open V5.20 mdat files

Beta version downloads are hosted at AV Nirvana, home of the REW support forum. To view the REW revision history click here.

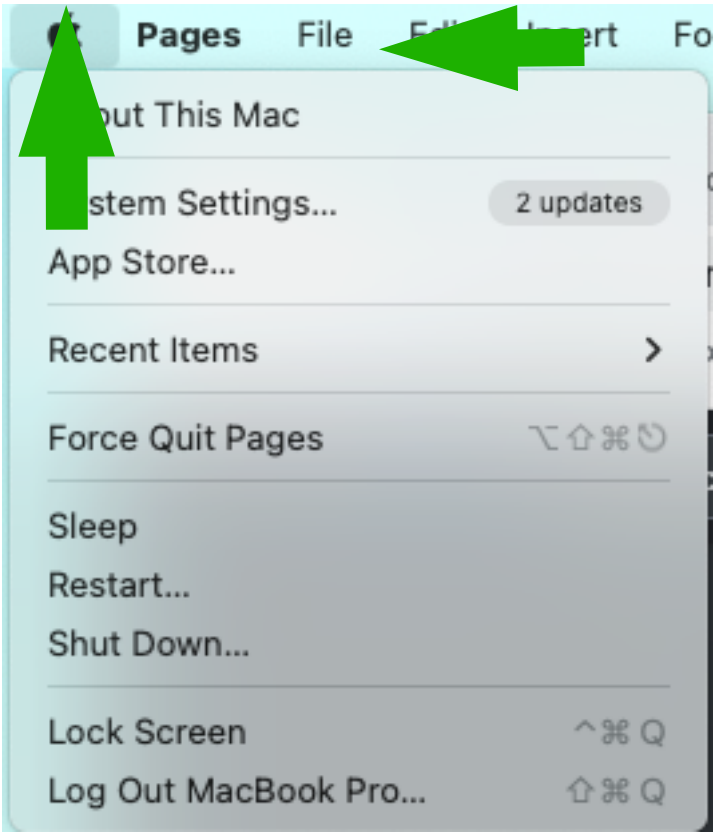
OS	Downloads
Win 11/10/8/7 Vista XP Pro x64	Windows 64-bit installer (42.9 MB, includes private 64-bit Java 8 runtime) Windows 32-bit installer (43.3 MB, includes private 32-bit Java 8 runtime)
10.11 - 12	macOS DMG (51.3 MB, includes private Java 8 runtime) Notarized universal binary for Intel and M1 Macs. **On Ventura set the theme to Light (not Auto or Dark) to run the installer**. Mic access is included in the code signature and will be requested if necessary. A mic access prompt for REW can be forced using `tccutil reset Microphone` from a terminal before starting REW then using a feature that requires mic access, such as the SPL meter
AMD64	Linux AMD64 installer (42.7 MB, includes private Java 8 AMD64 runtime)
	Linux installer (22.4 MB, requires a Java 8 runtime)
All	Sampledata.mdat (8.0 MB) Sample measurement data

Step 2. Using the extension cable and the 3.5mm male to male adapter, plug the soundcard input into its output. Plug the soundcard into an open USB port on your PC.

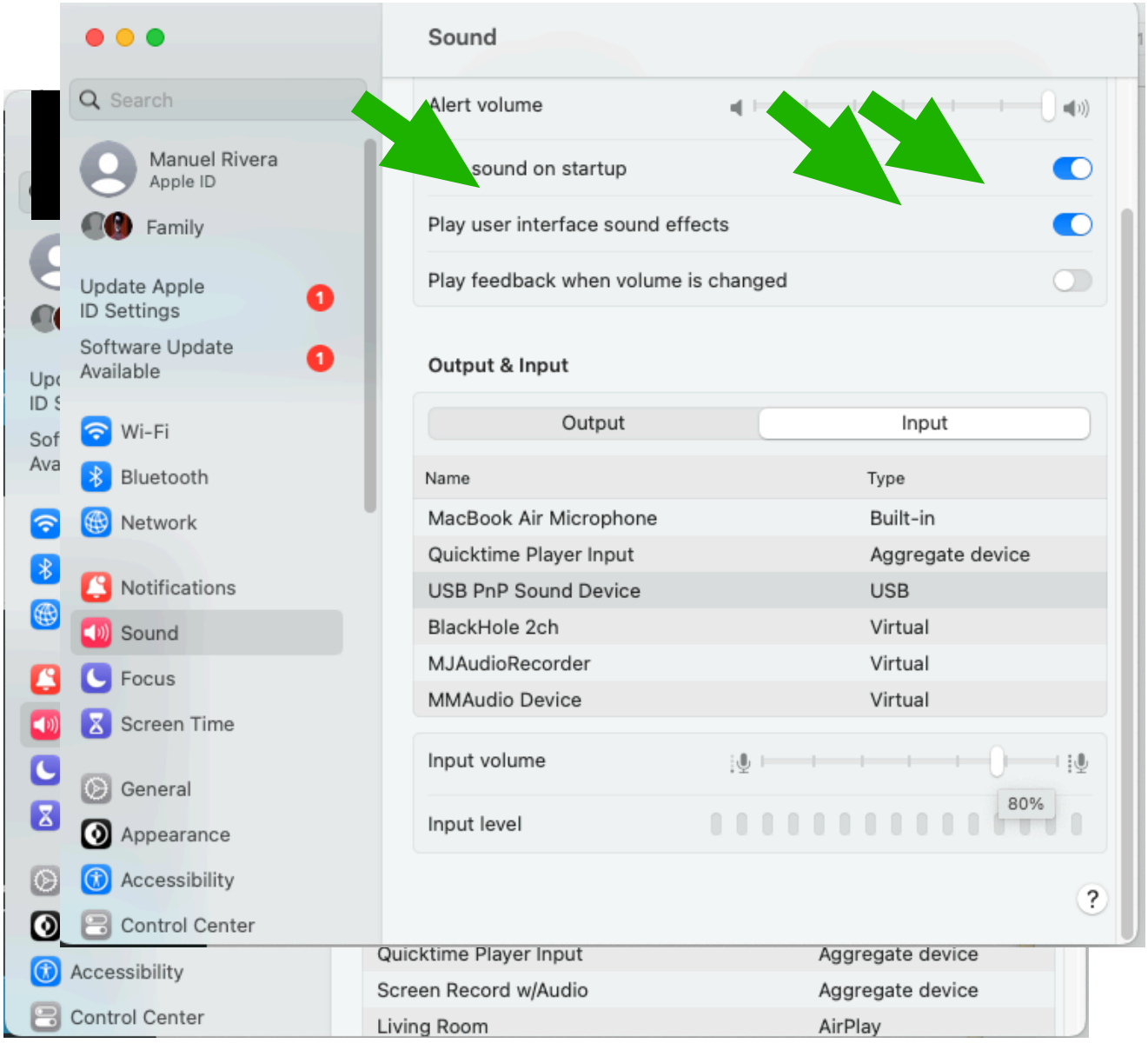


Step 2 insert the soundcard in to your laptops usb port

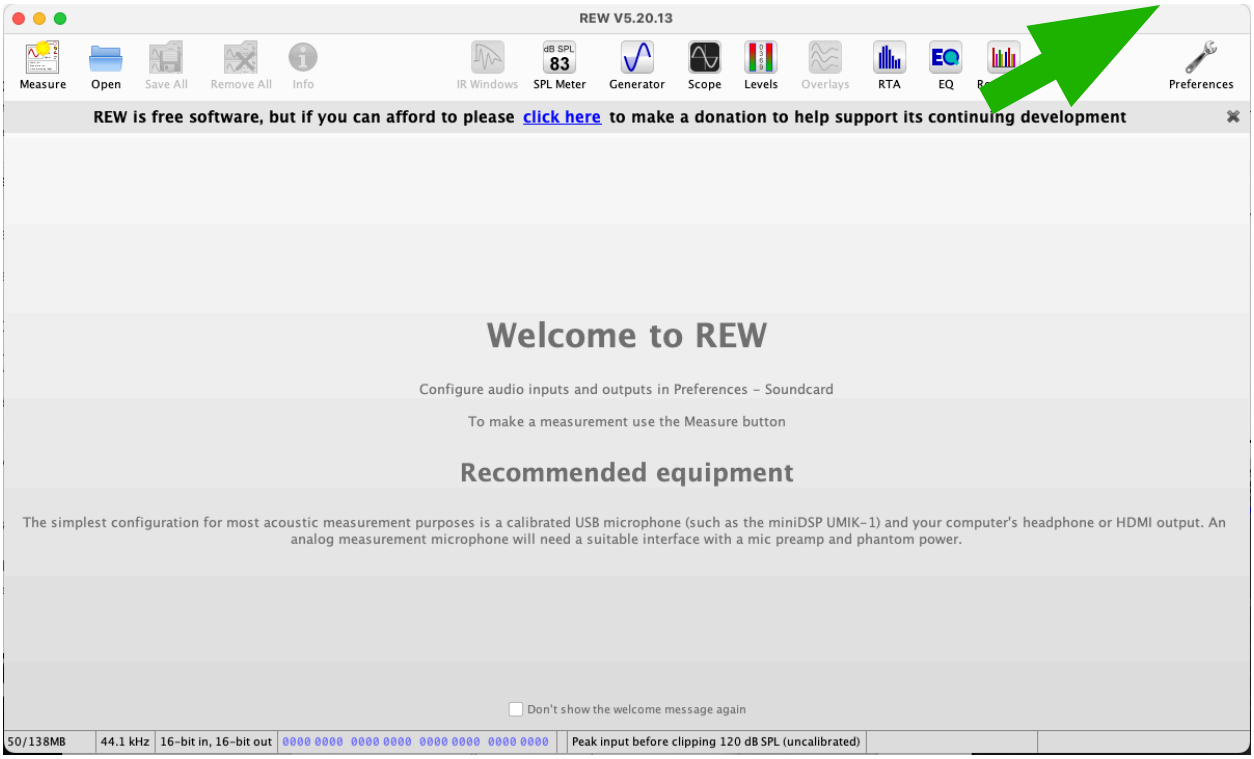
Step 3.Click the apple in the upper right corner then select “System Settings”.



Step 4. Next select “Sound” then select “USB PnP Sound Device” as your output device. Select Input, select “USB Device” then scroll down to the bottom and set the level to 80.

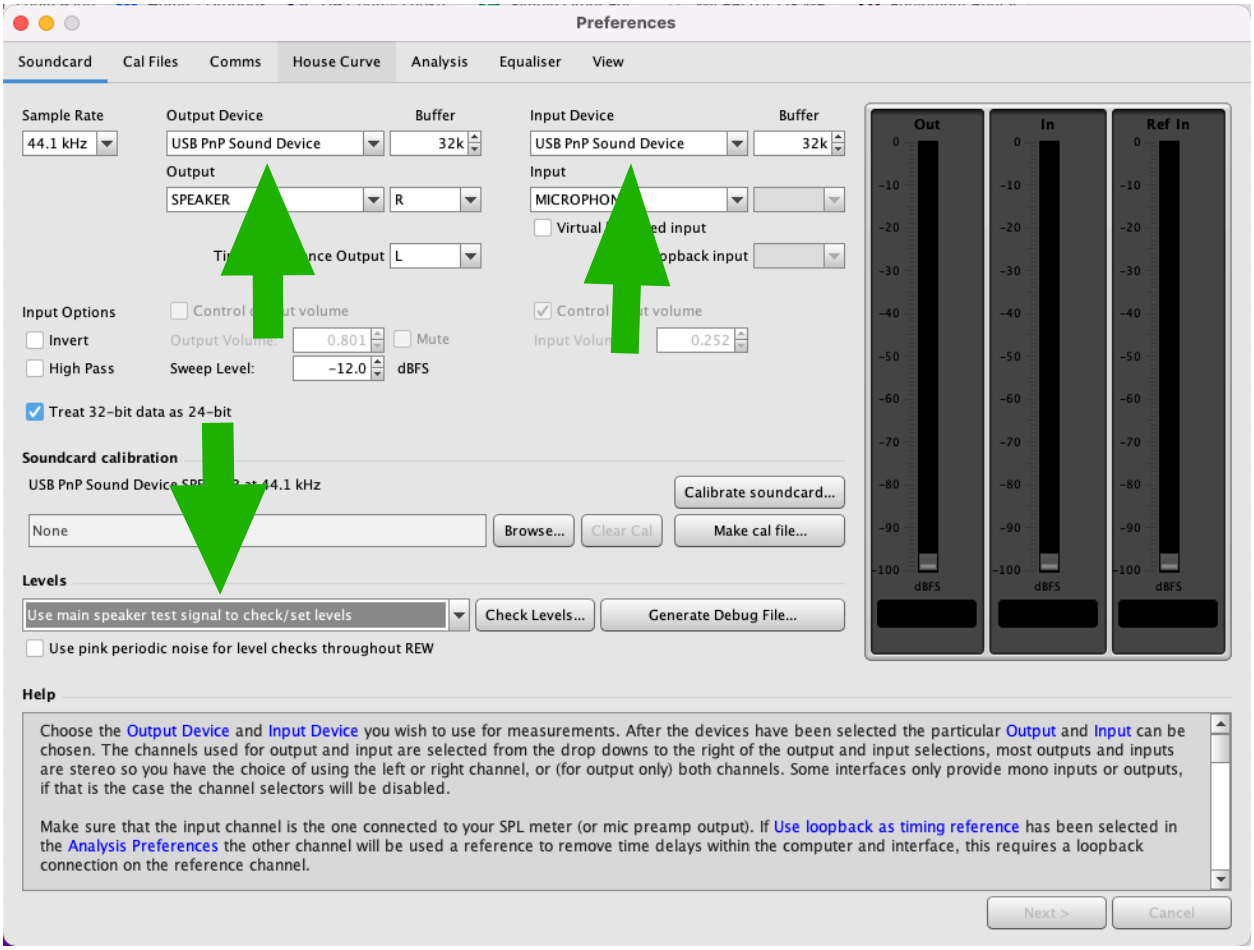


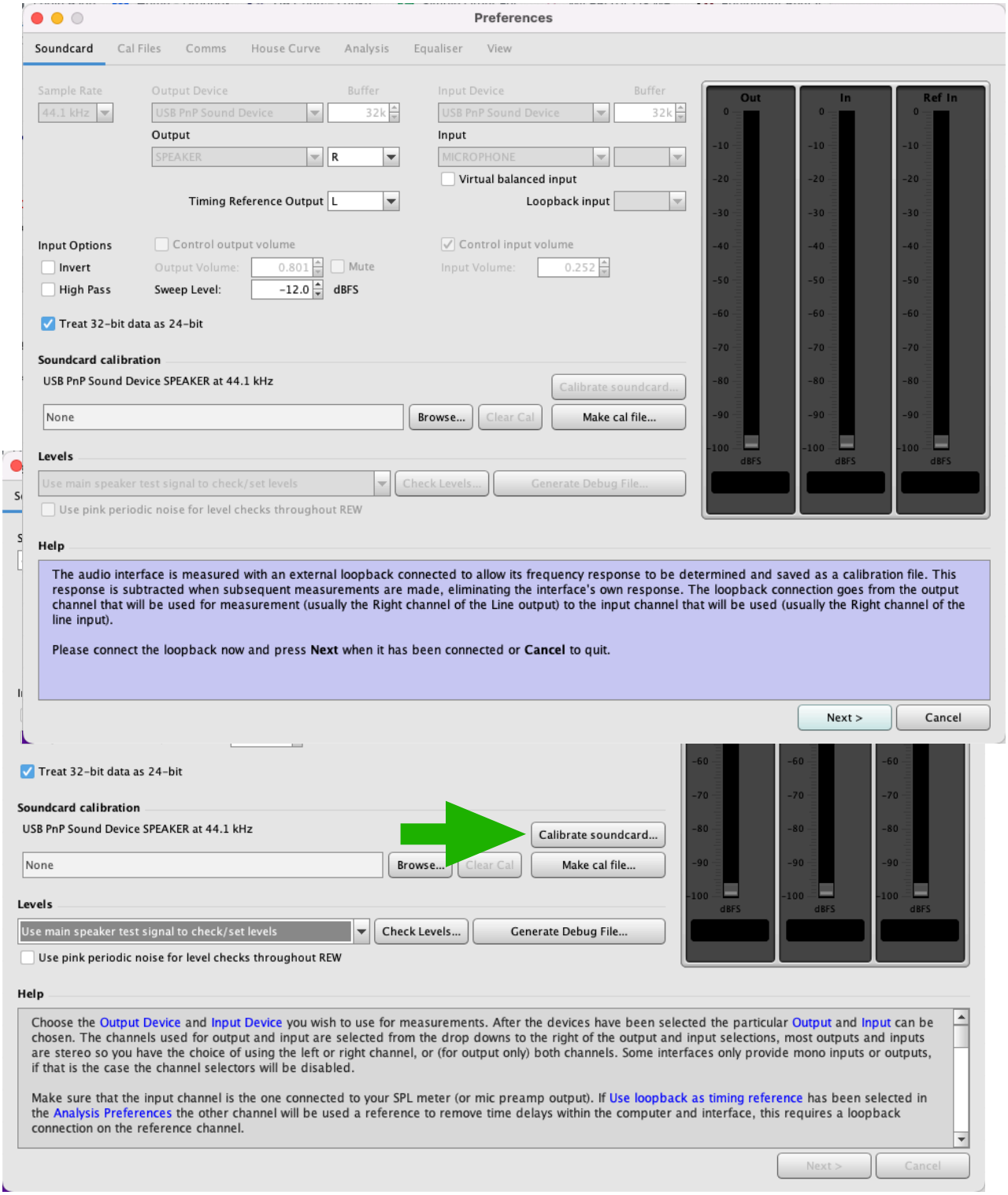
Step 5. Run Room EQ Wizard and Click Preferences.



Step 6. Use the down arrows and the drop down menus to select the USB device in the “Input” and “Output” selection boxes. Also, choose “Use main speaker signal to check/set levels”. Double

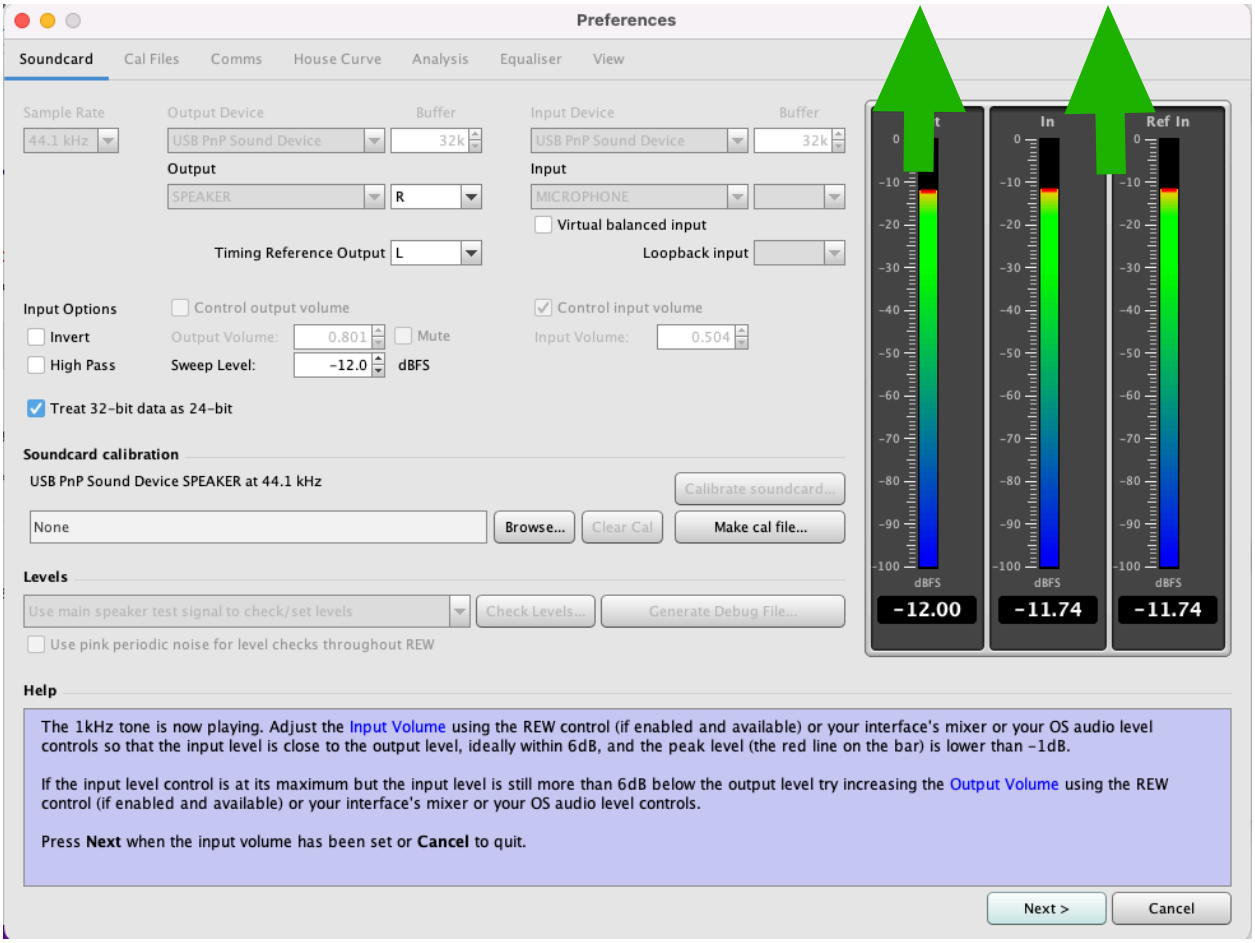
check that all of the other boxes in the “Soundcard” panel match the settings shown below.

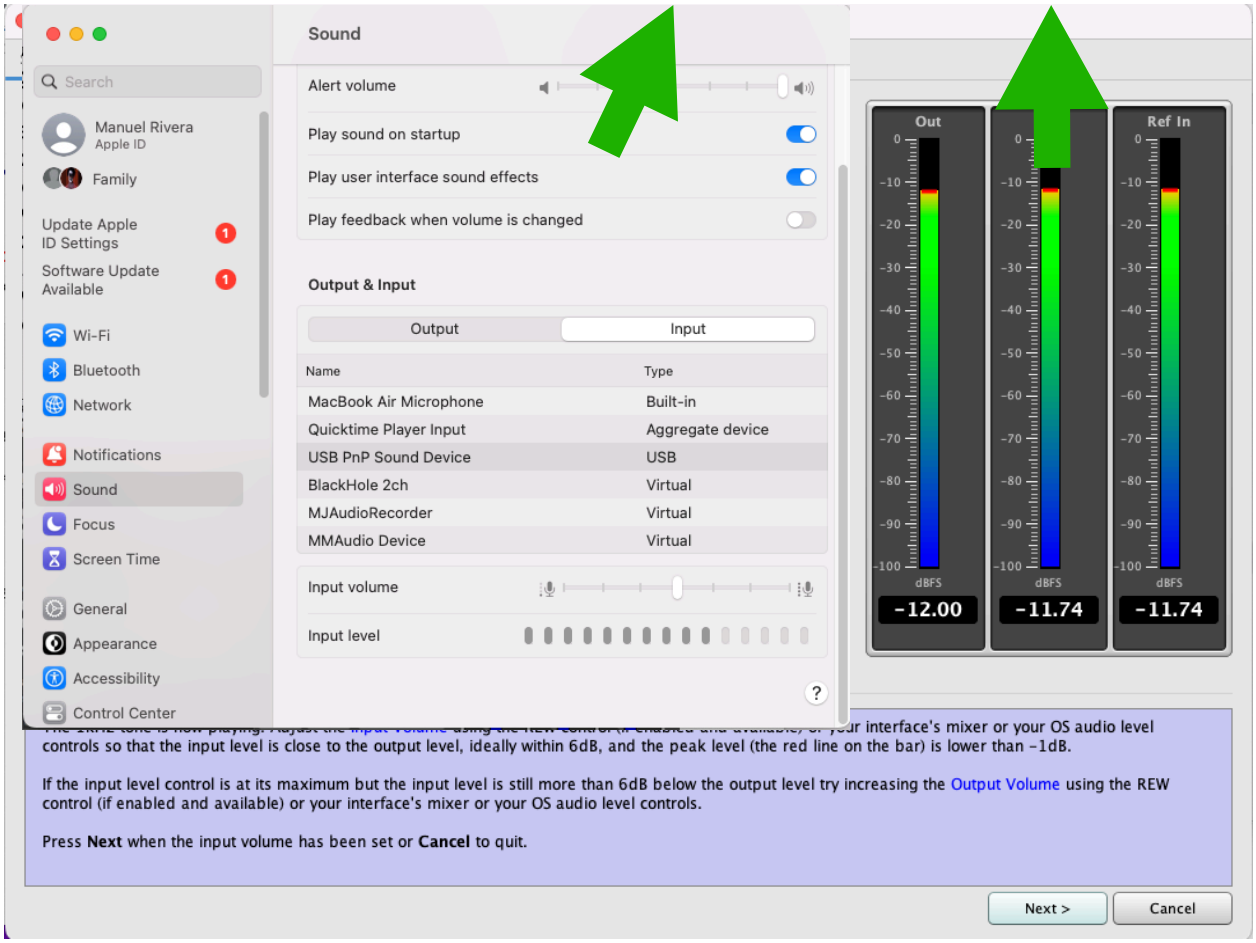




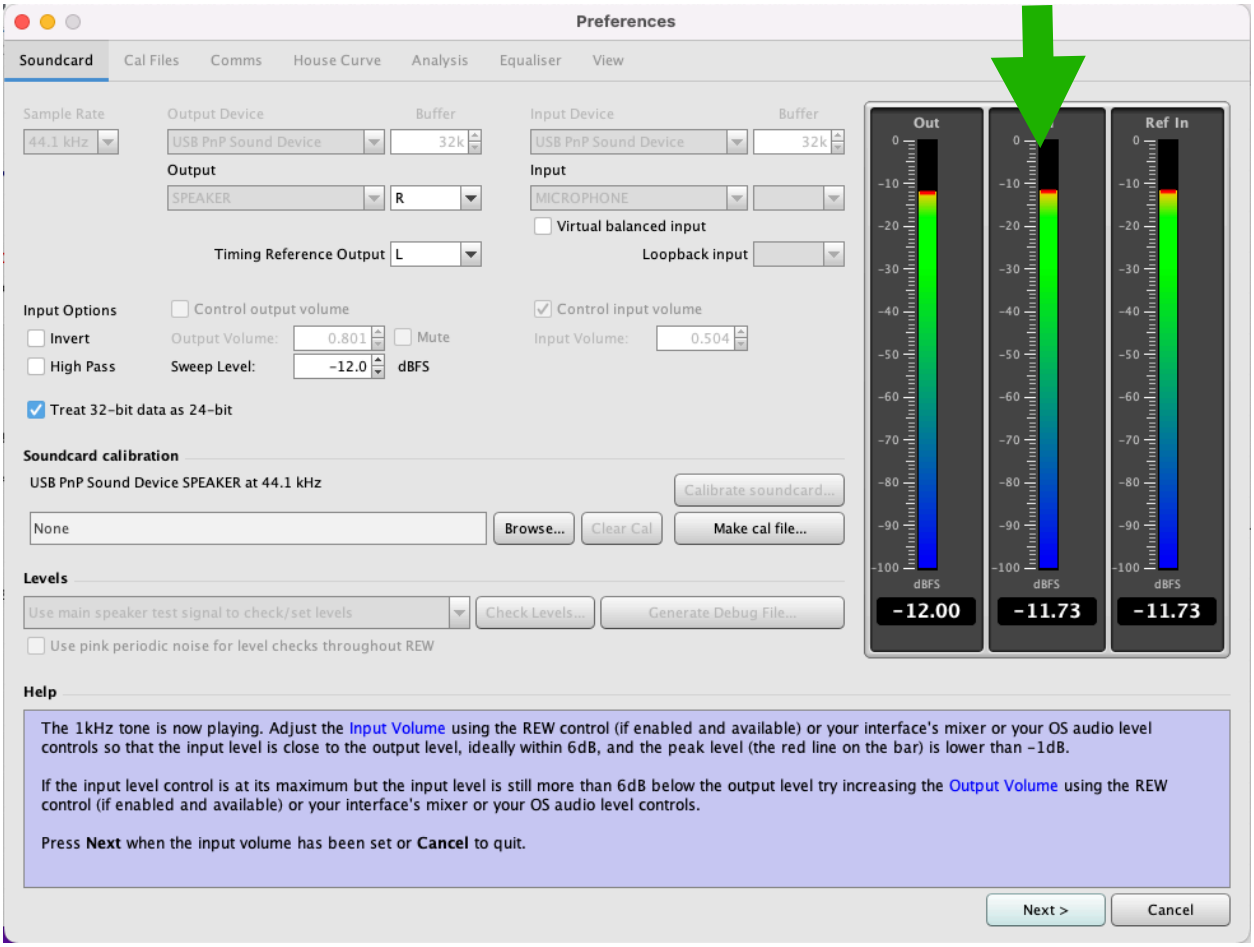
Step 7. Click “Calibrate”. After you click “Calibrate”, the information in the “Help” box will change to indicate the next steps. Read it if you want. If not, click “Next” and then click “Next” again.

Step 8. After you've clicked "Next" twice, the analyzer will send a signal out through the soundcard and receive the signal through the sound card. The three level bars indicate the output level (left), the input level (center) and the reference input level (in this configuration,(the In and Ref In are the same). Check the level meters. The inputs should be within about one dB of the output level. If they aren't, In the upper right corner click the apple then select sound, In the sound section select input. Adjust the level of the microphone while watching the level bars. When they are within one dB of the output, click OK in the microphone panel.

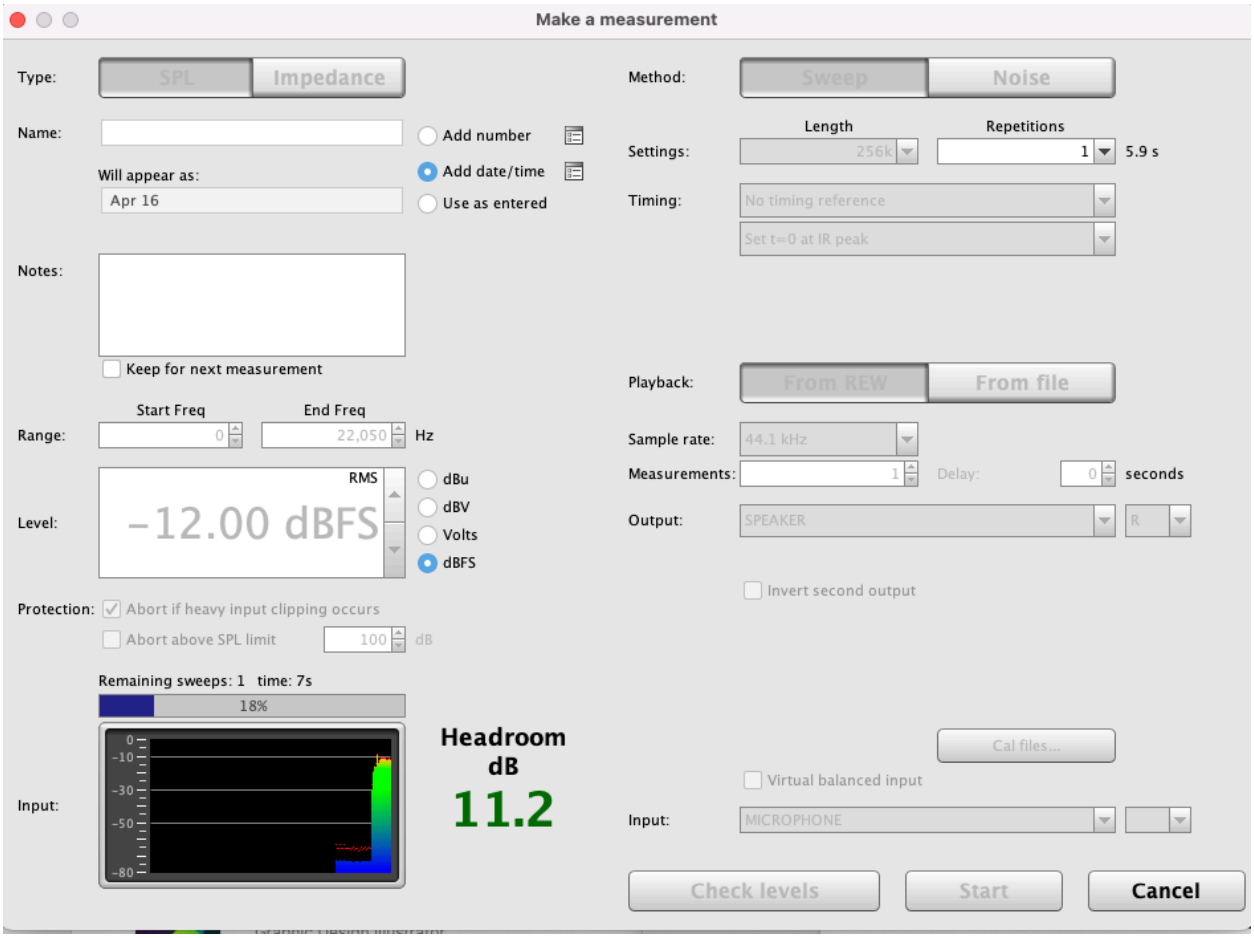

Preferences
Soundcard
Cal Files
Comms
House Curve
Analysis
Equaliser
View
Sample Rate
44.1 kHz
Output Device
USB PnP Sound Device
Buffer
32k
Input Device
USB PnP Sound Device
Buffer
32k
Output
SPEAKER
R
Input
MICROPHONE
Virtual balanced input
Timing Reference Output
L
Loopback input
Input Options
Invert
High Pass
Control output volume
Output Volume:
0.801
Mute
Sweep Level:
-12.0
dBFS
Control input volume
Input Volume:
0.504
Treat 32-bit data as 24-bit
Soundcard calibration
USB PnP Sound Device SPEAKER at 44.1 kHz
Calibrate soundcard...
None
Browse...
Clear Cal
Make cal file...
Levels
Use main speaker test signal to check/set levels
Check Levels...
Generate Debug File...
Use pink periodic noise for level checks throughout REW
In
Ref In
dBFS
-12.00
-11.74
-11.74
Help
The 1kHz tone is now playing. Adjust the Input Volume using the REW control (if enabled and available) or your interface's mixer or your OS audio level controls so that the input level is close to the output level, ideally within 6dB, and the peak level (the red line on the bar) is lower than -1dB.
If the input level control is at its maximum but the input level is still more than 6dB below the output level try increasing the Output Volume using the REW control (if enabled and available) or your interface's mixer or your OS audio level controls.
Press Next when the input volume has been set or Cancel to quit.
Next >
Cancel



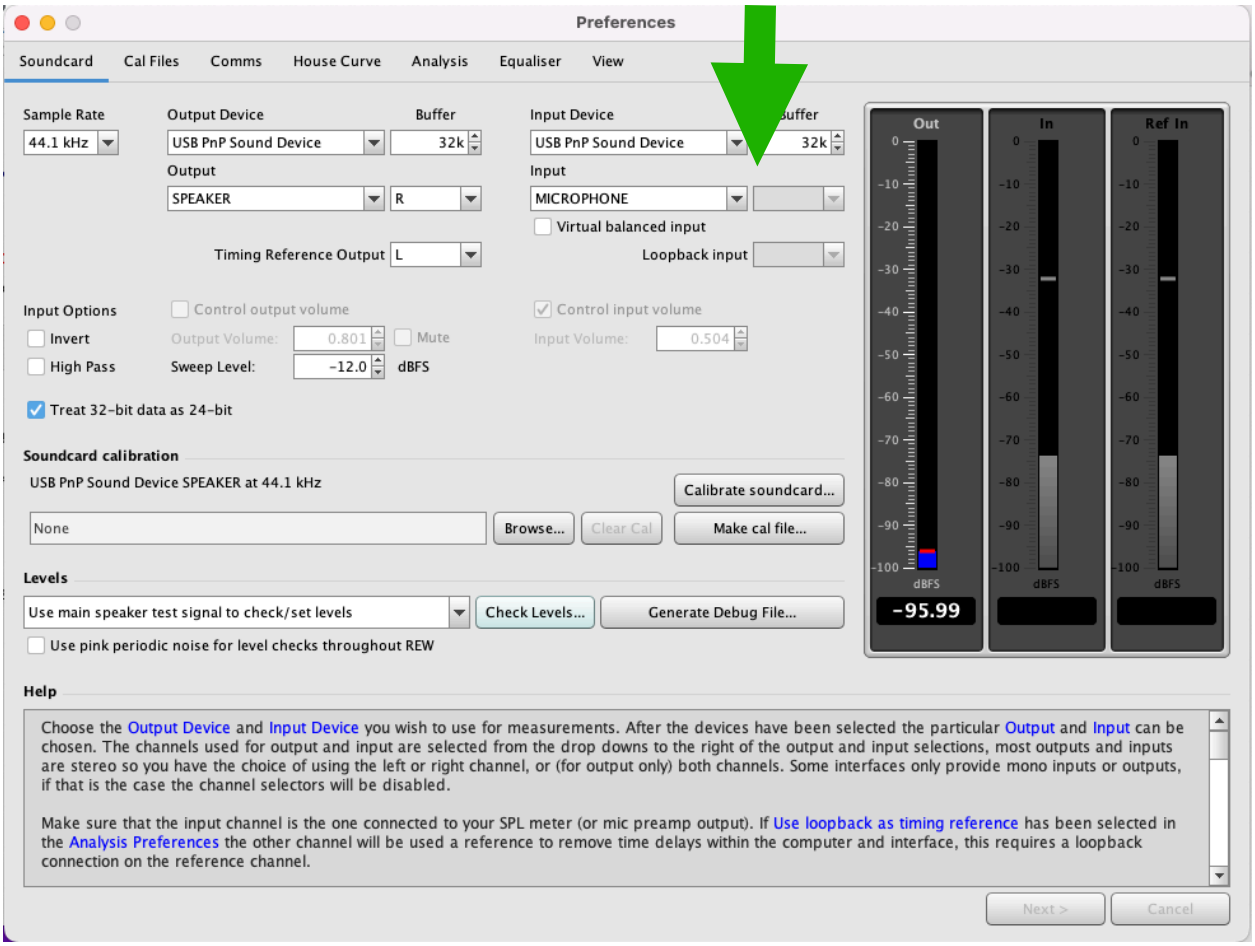
Step 9. Click “Next” in REW’s Soundcard panel. Then click “Next” again.



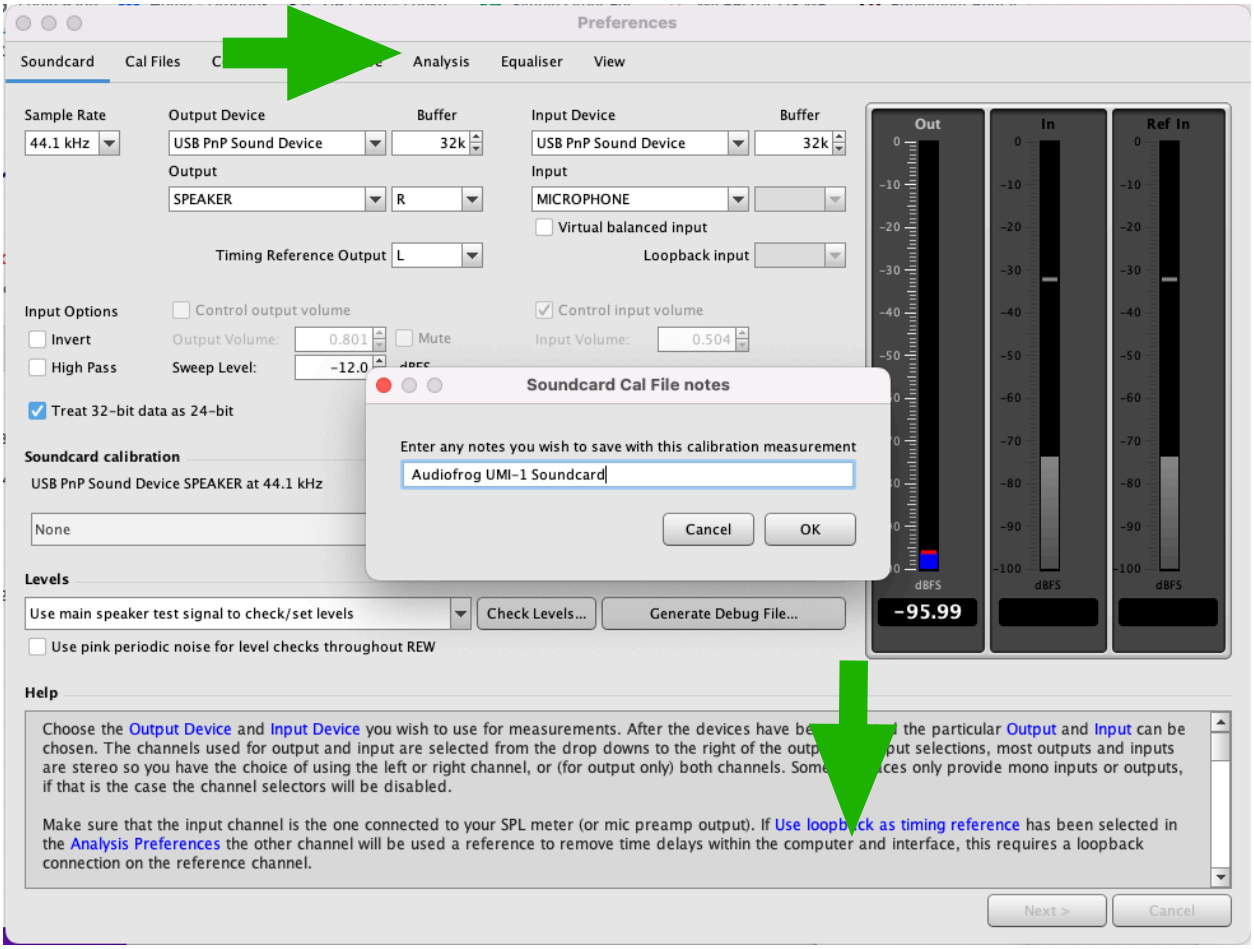
Step 10. REW will start a measurement, which will take a few seconds. Once the measurement is complete, it will be displayed in the measurement panel. Ignore that, for now.



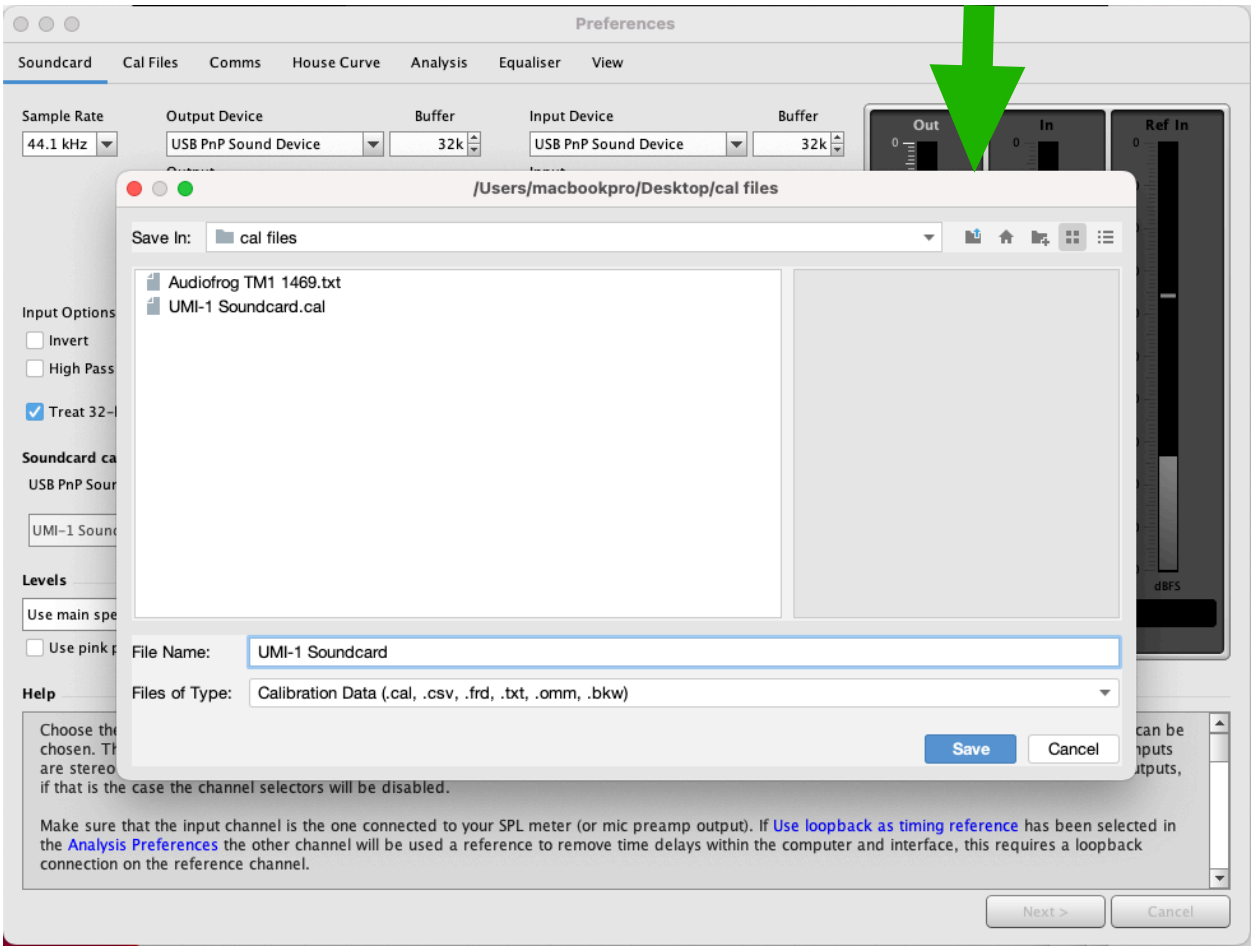
Step 11. Click “Make Cal” to store the measurement.



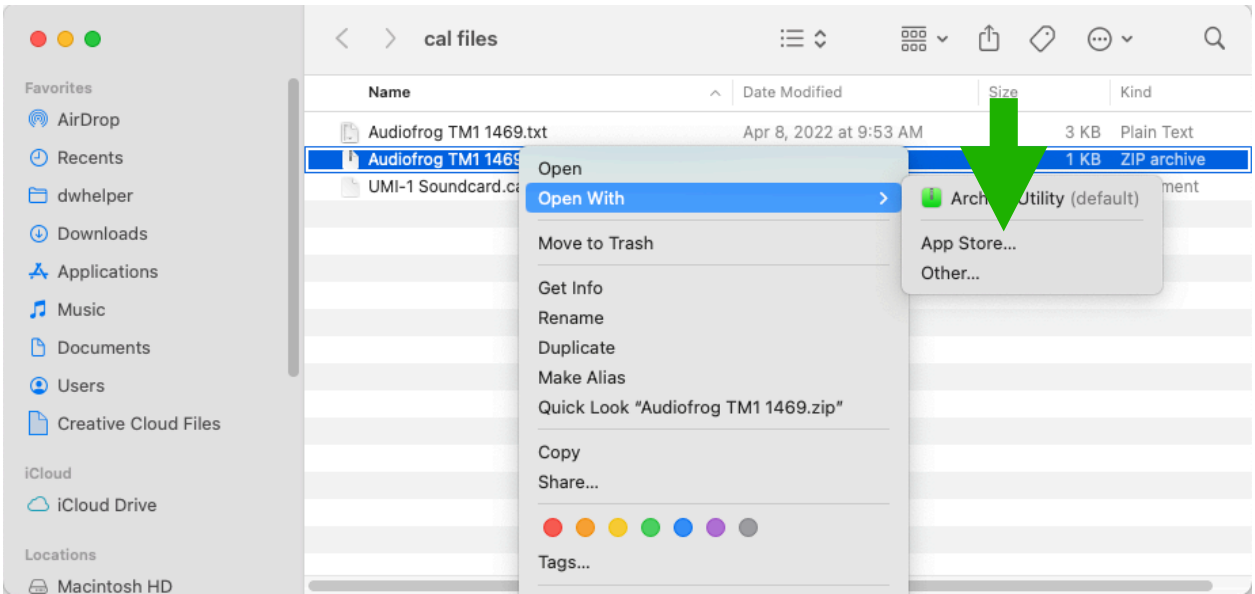
Step 12. In the “Notes” box, type “Audiofrog UMI-1 Soundcard”. Click OK



Step 13. Then, choose a location to store the soundcard calibration file in your computer, name the file “UMI-1 Soundcard” and click “Save”.

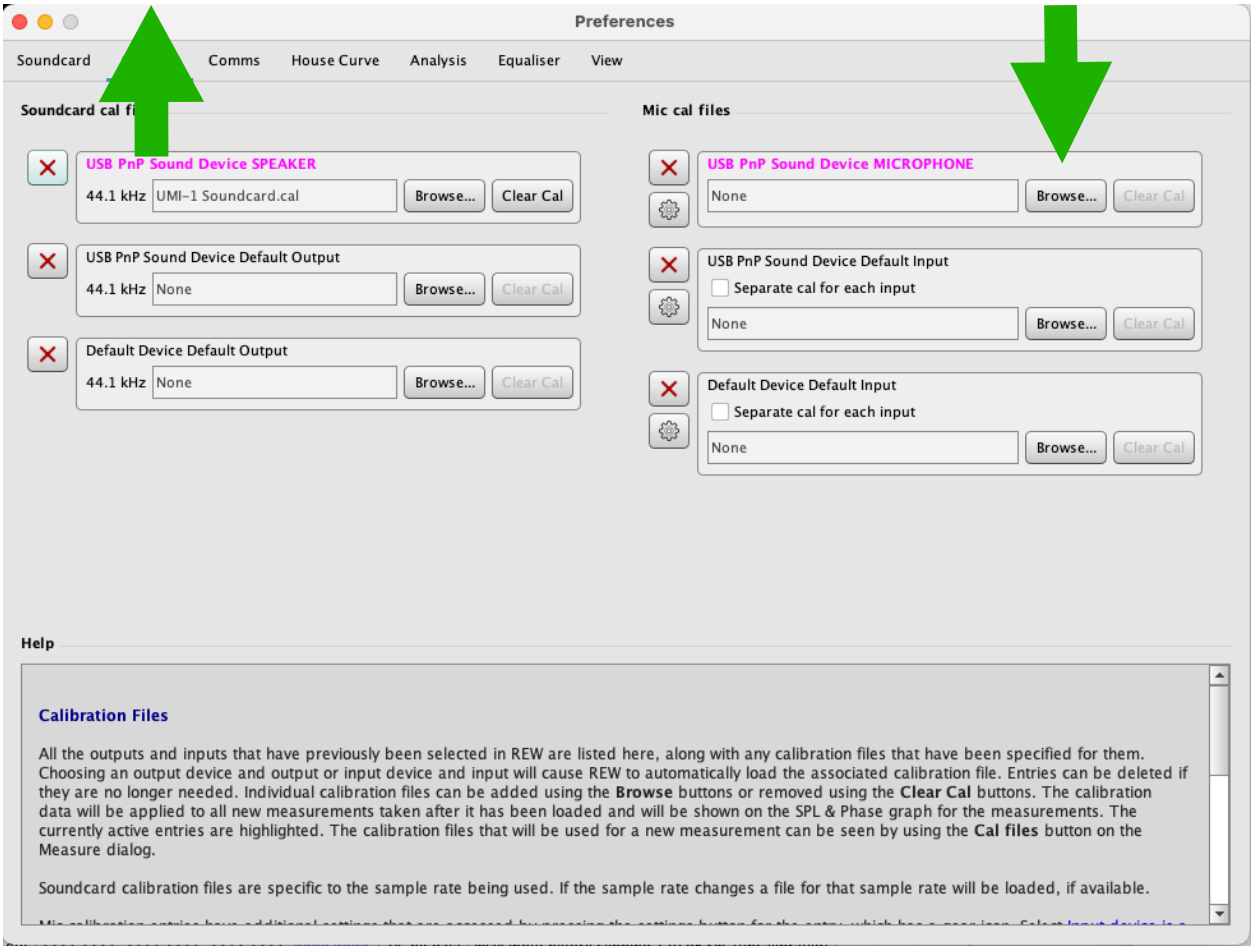


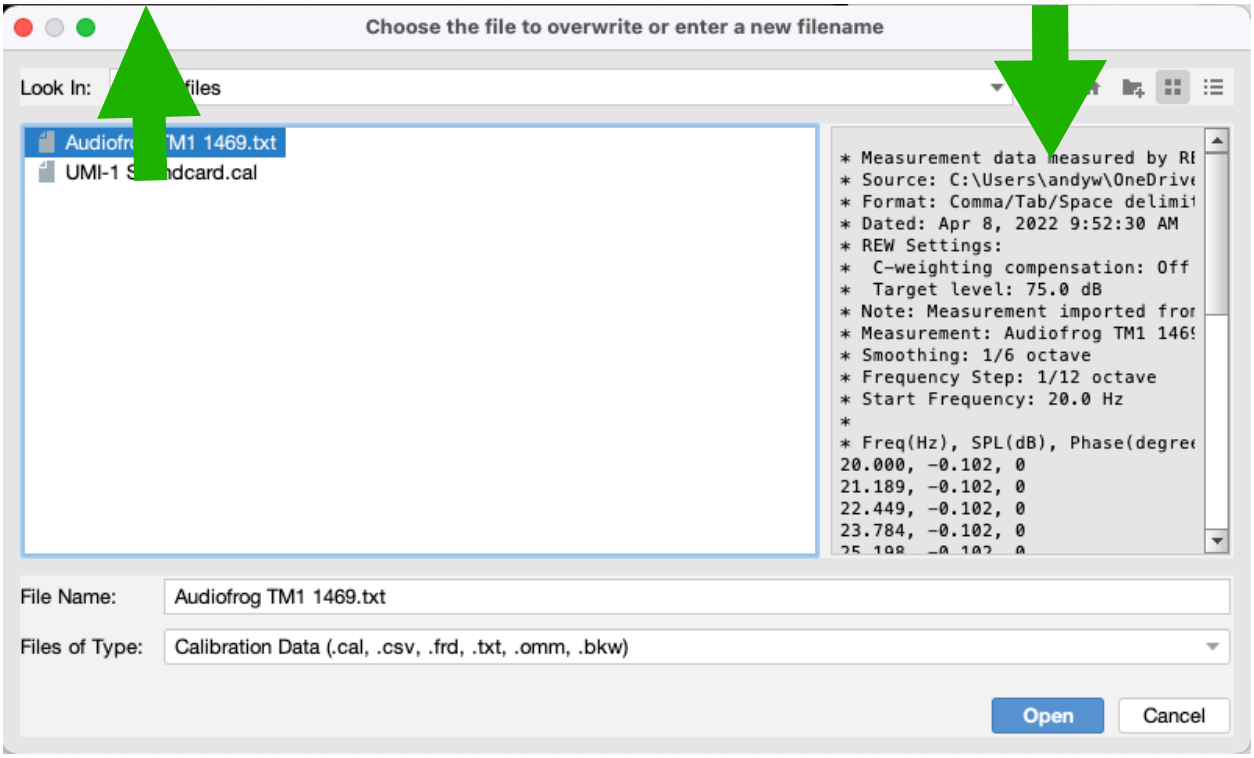
Step 14. Save the Mic Calibration file you received in an email from Audiofrog in the same place where you saved the soundcard calibration file. Right click on the .zip file and choose “Open with” then select archive utility to extract the text file to the same folder in which the zip file and the soundcard calibration file are stored.



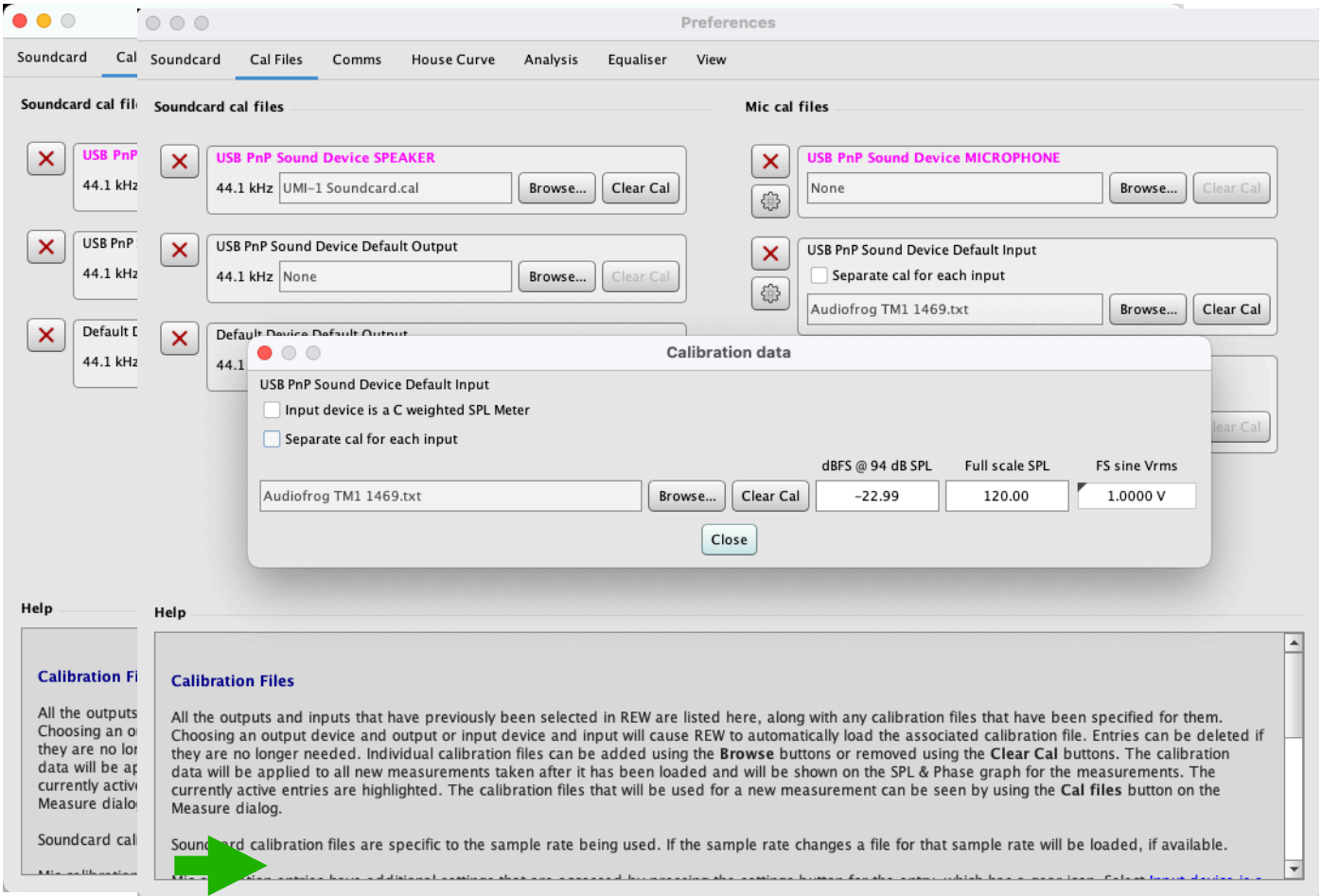
Step 15. In REW, Click on the “Cal Files ” tab in the Preferences panel. Click “browse” next to the usb device under the “Mic cal files” column.

Step 16. Find the Audiofrog TM-1 calibration file. Double click on the file to choose it or click once to highlight it and click “Open”


Preferences
Soundcard
Comms
House Curve
Analysis
Equaliser
View
Soundcard cal fi
Mic cal files
USB PnP Sound Device SPEAKER
44.1 kHz
UMI-1 Soundcard.cal
Browse...
Clear Cal
USB PnP Sound Device Default Output
44.1 kHz
None
Browse...
Clear Cal
Default Device Default Output
44.1 kHz
None
Browse...
Clear Cal
USB PnP Sound Device MICROPHONE
None
Browse...
Clear Cal
USB PnP Sound Device Default Input
Separate cal for each input
None
Browse...
Clear Cal
Default Device Default Input
Separate cal for each input
None
Browse...
Clear Cal
Help
Calibration Files
All the outputs and inputs that have previously been selected in REW are listed here, along with any calibration files that have been specified for them. Choosing an output device and output or input device and input will cause REW to automatically load the associated calibration file. Entries can be deleted if they are no longer needed. Individual calibration files can be added using the Browse buttons or removed using the Clear Cal buttons. The calibration data will be applied to all new measurements taken after it has been loaded and will be shown on the SPL & Phase graph for the measurements. The currently active entries are highlighted. The calibration files that will be used for a new measurement can be seen by using the Cal files button on the Measure dialog.
Soundcard calibration files are specific to the sample rate being used. If the sample rate changes a file for that sample rate will be loaded, if available.



Step 17. Click the settings wheel next to the usb device under the "Mic cal files column". Make sure both boxes are unchecked.

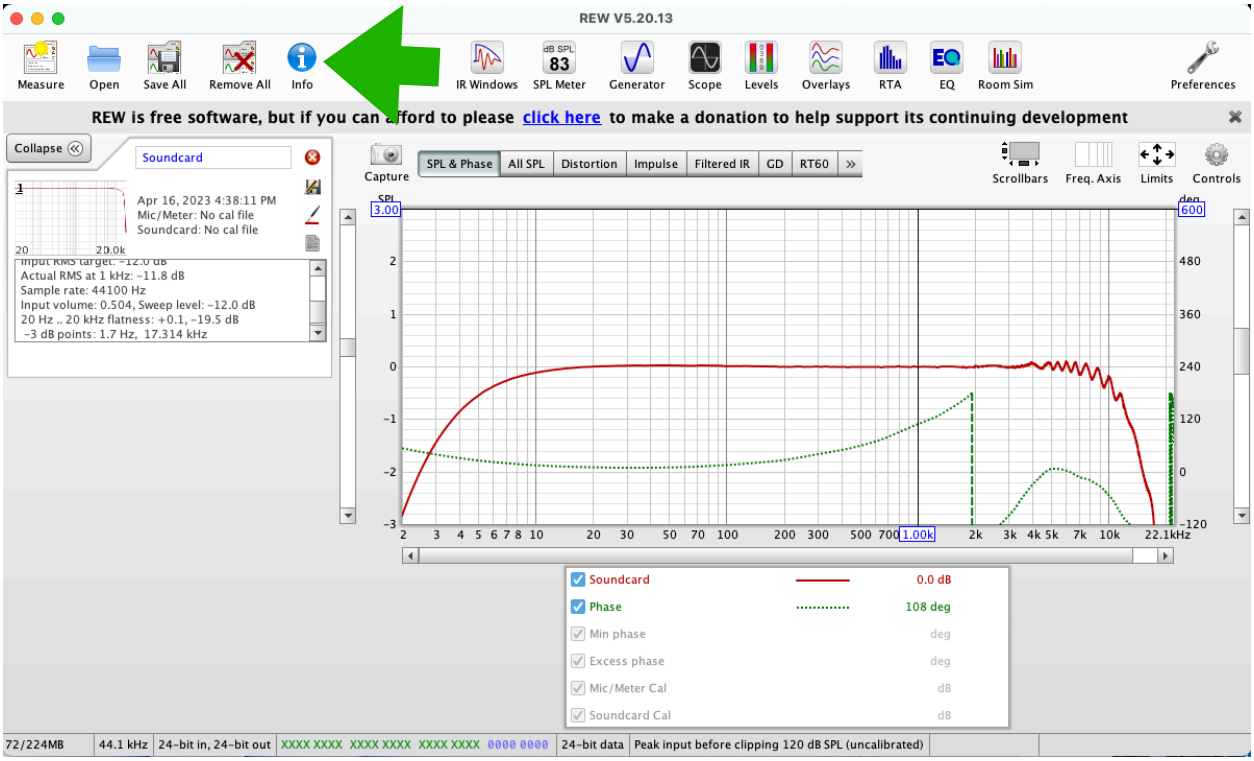


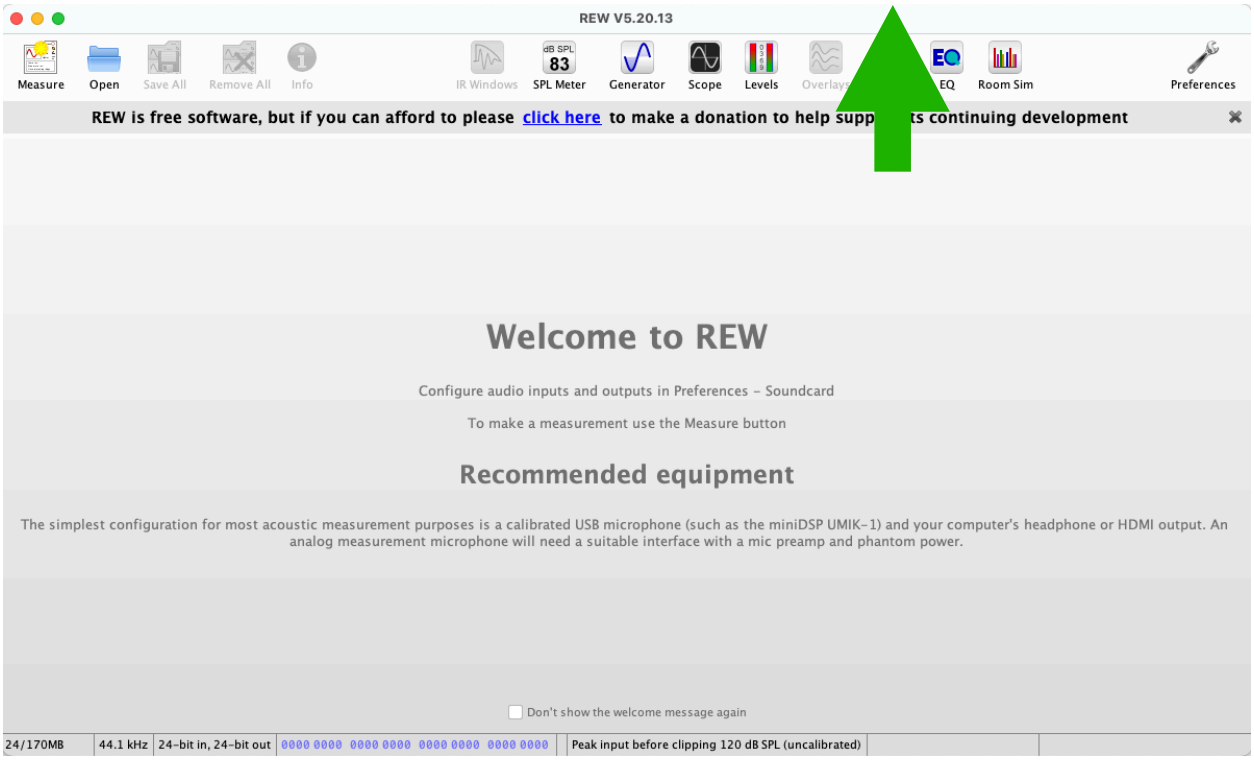
That's it. You only have to do this once. So long as you plug the USB soundcard into your computer before starting REW, you'll won't have to do this again. **Be sure to remember or to write down the settings you chose in the Windows mixer if you'll use this computer for other stuff. If you adjust those, you'll need to set them back the values you chose during the setup process the next time you use your UMI-1.**

Using RTA in REW

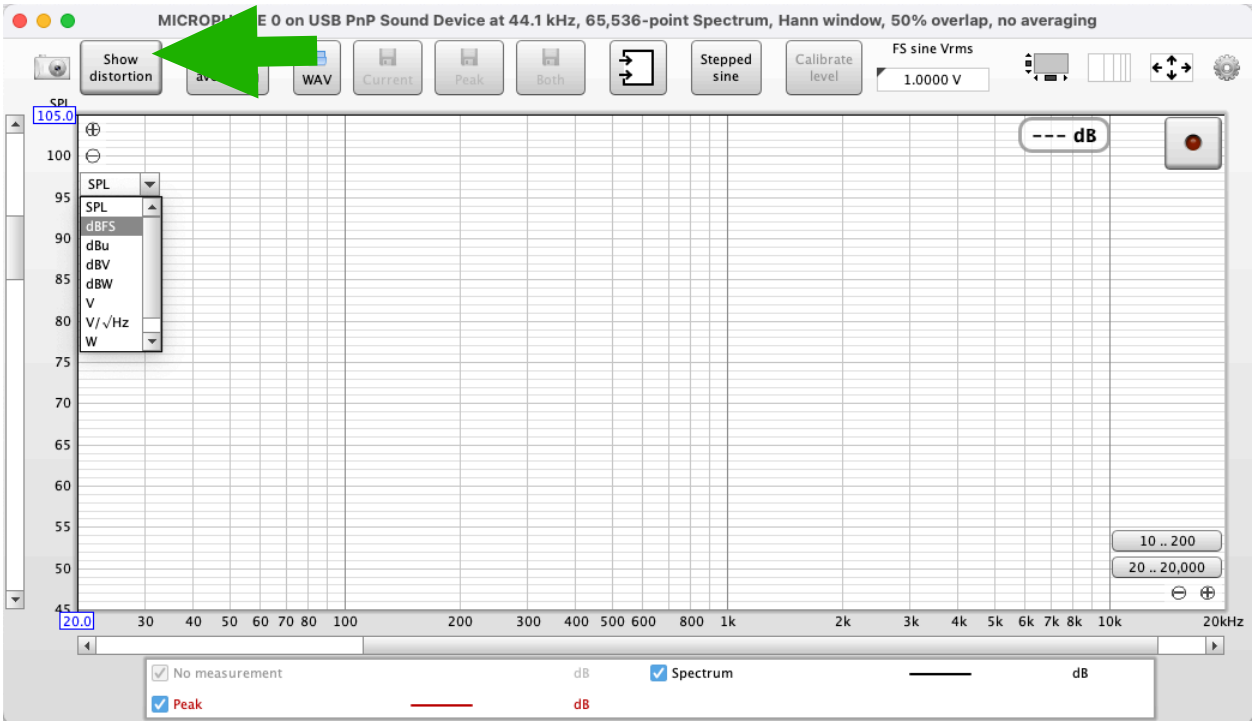
Step 1. In REW's main panel, click here to close your soundcard measurement. There's no need to save it because it's already been saved and loaded as a calibration file.(if java error occurs click don't send.)

Step 2. Click on RTA at the top of the screen.

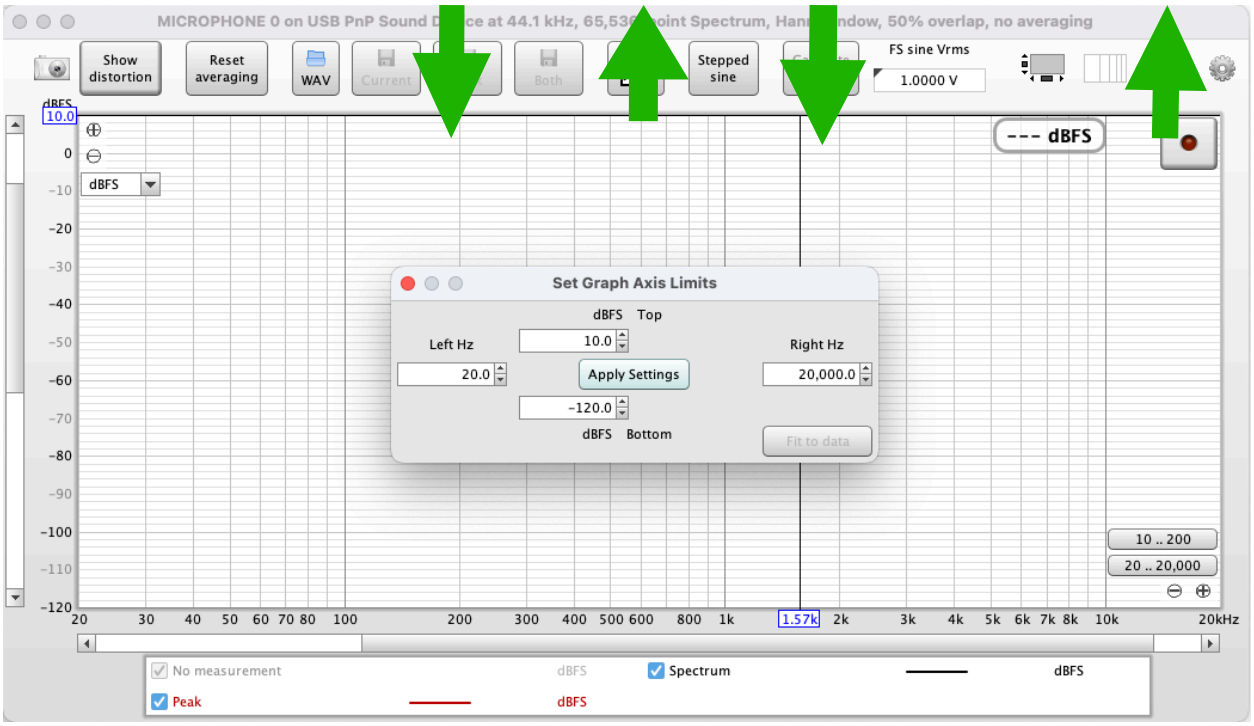

REW V5.20.13
Measure
Open
Save All
Remove All
Info
IR Windows
SPL Meter
83
Generator
Scope
Levels
Overlays
RTA
EQ
Room Sim
Preferences
REW is free software, but if you can afford to please click here to make a donation to help support its continuing development
Collapse
Soundcard
Apr 16, 2023 4:38:11 PM
Mic/Meter: No cal file
Soundcard: No cal file
Actual RMS at 1 kHz: -11.8 dB
Sample rate: 44100 Hz
Input volume: 0.504, Sweep level: -12.0 dB
20 Hz .. 20 kHz flatness: +0.1, -19.5 dB
-3 dB points: 1.7 Hz, 17.314 kHz
Capture
SPL & Phase
All SPL
Distortion
Impulse
Filtered IR
GD
RT60
Scrollbars
Freq. Axis
Limits
Controls
3.00
600
480
360
240
120
0
-120
2 3 4 5 6 7 8 10 20 30 50 70 100 200 300 500 700 1.00k 2k 3k 4k 5k 7k 10k 22.1kHz
Soundcard 0.0 dB
Phase 108 deg
Min phase deg
Excess phase deg
Mic/Meter Cal dB
Soundcard Cal dB
72/224MB
44.1 kHz
24-bit in, 24-bit out
24-bit data
Peak input before clipping 120 dB SPL (uncalibrated)



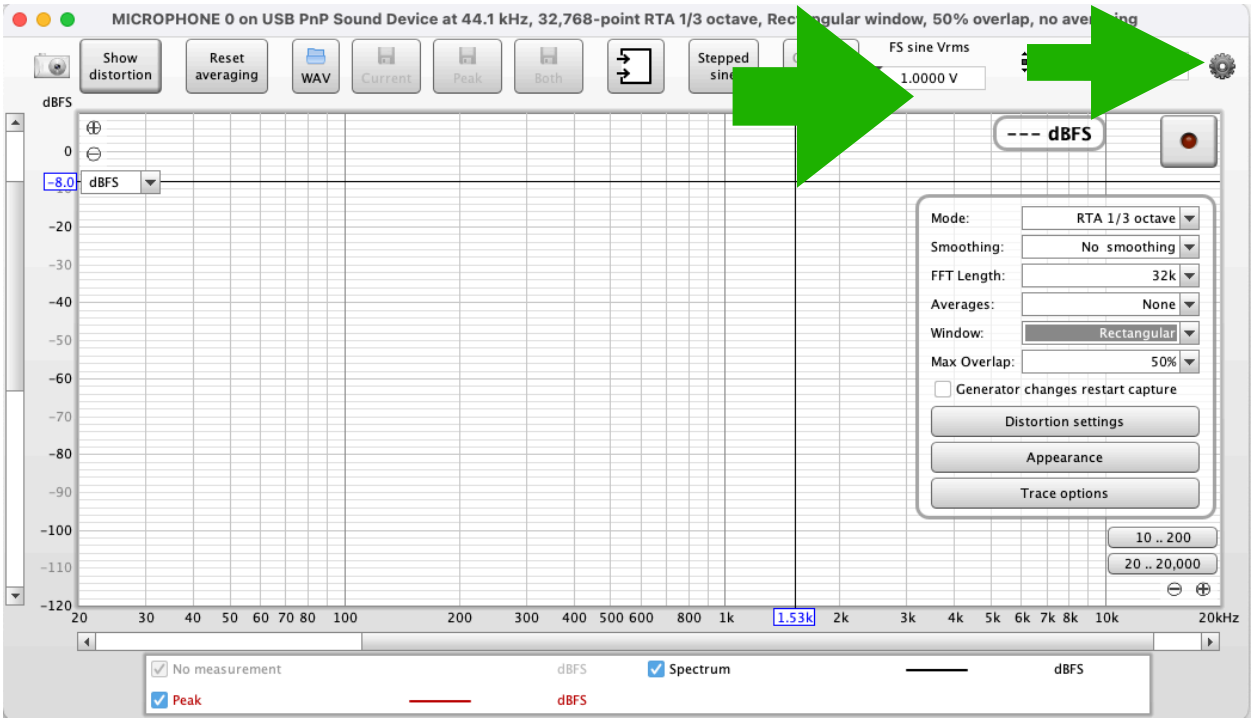
Step 3. In the small drop down menu on the left, choose “dBFS” instead of “dB”.



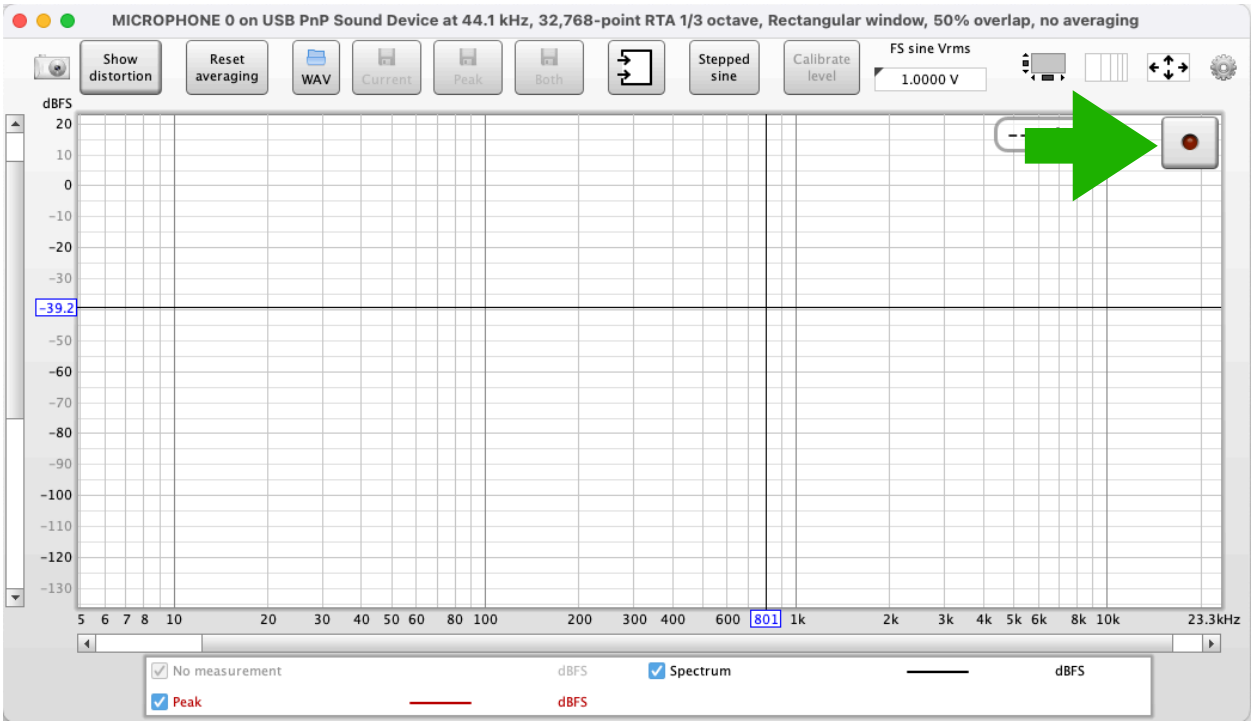
Step 4. Click on the “Limits” box at the top right of the display and enter “20” in the Left box and 20000 in the Right box. Leave the top at 10 and the bottom at -120. Click “Apply Settings”



Step 5. Click on the “Settings” wheel and in the top drop down box, choose 1/3 Octave fir the Mode. Choose 32768 for the FFT length. Choose None for Averages. Choose “Rectangular” for the Window. Choose 50% for Max Overlap. Select “Bars” for the RTA and for “Spectrum”. Click the settings wheel to close the box.



Step 6.To start the RTA, click on the red “record” button. Start Track 1 on the Tuning CD and measure the frequency response of the system.



That's it! When you close REW, it will remember all of these settings the next time you open it unless you choose "Delete Preferences and Shut Down". If you chose that, you'll have to repeat this process. One of the reasons we recommend REW, is that the help file is great and provides lots of easy to understand explanations of how this program works and how to use it. These instructions have been written to get you started using REW in a format that's similar to other Real Time Analyzers you may have used. There are many additional tools available in the program, too. We will provide some additional information, tips and tricks and tuning help in the Forum section of www.audiofrog.com.

Happy Tuning!