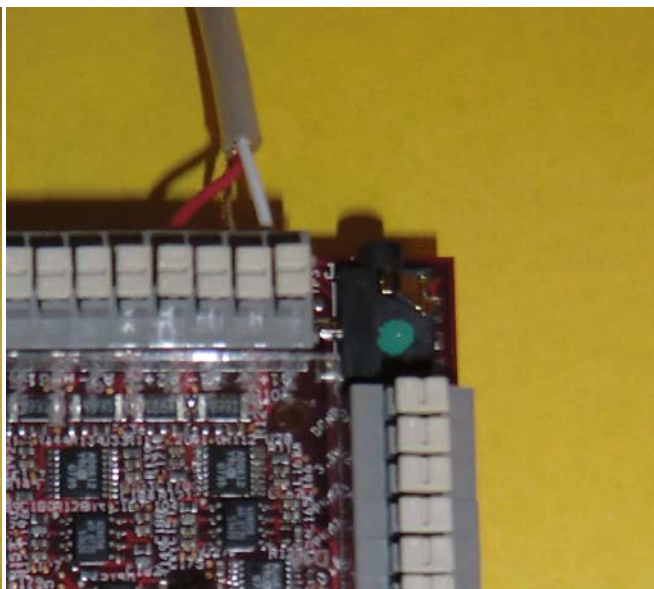
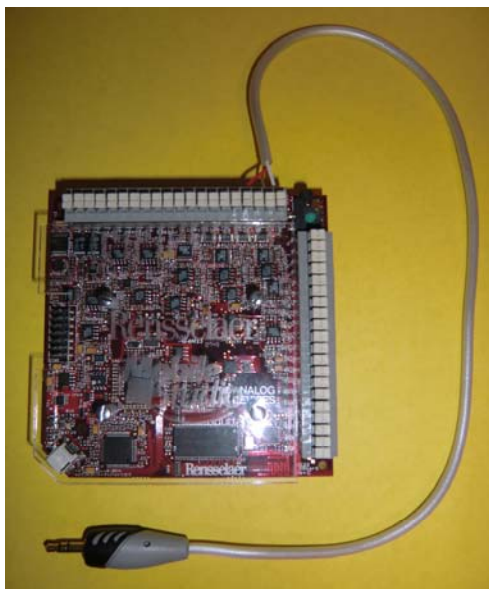
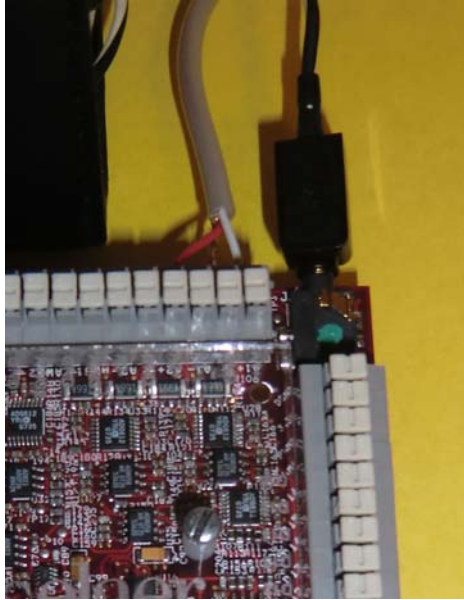


Simplified Directions for Audio:

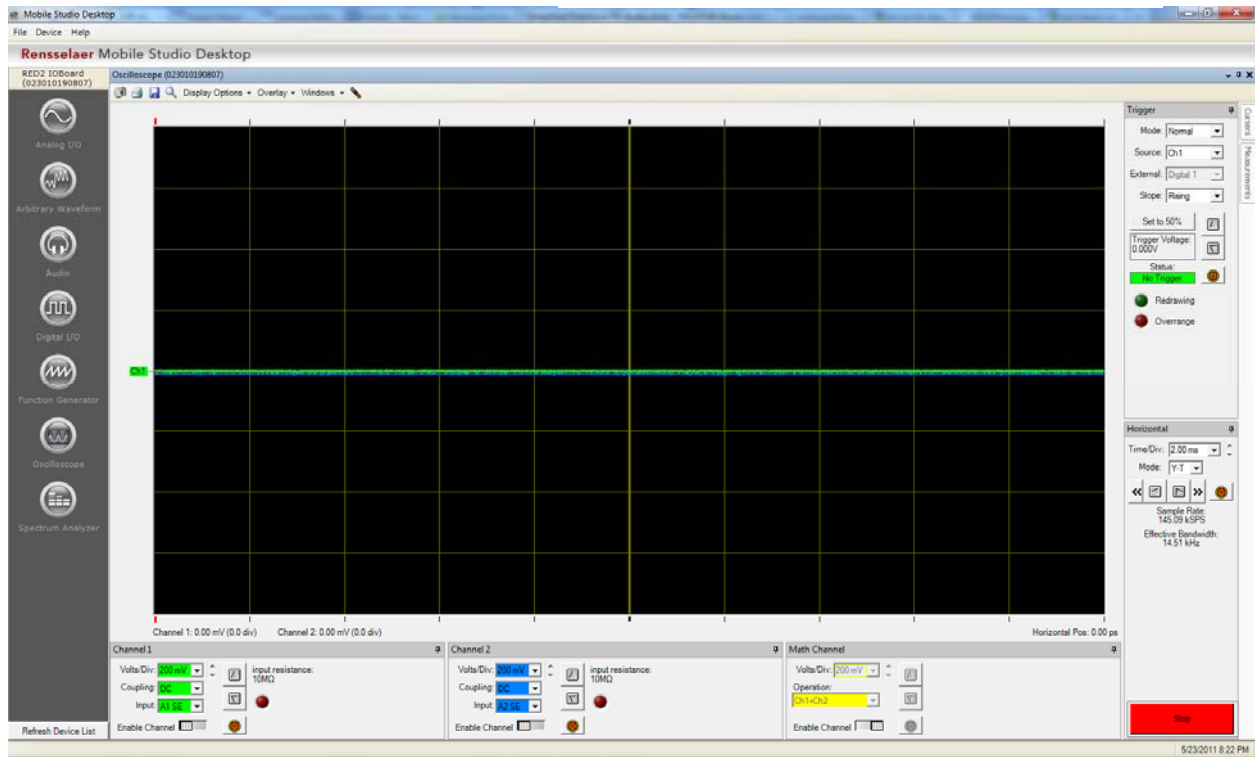
Using an audio cable for a standard MP3 player (iPod), you will have three wires: one for each of the two stereo channels and a ground. The ground wire is usually bare (no insulation), which makes it easier to identify. Connect the wire for one channel to A1+ and the wire for the other channel to A2+. Connect the ground wire to any of the GND connections (there are 6 GND connections on the right side of the board, but they are all connected together). The easiest GND connection to use is the one next to A1+. The other end of the audio cable can be connected to the output of the MP3 player, computer or other audio source.



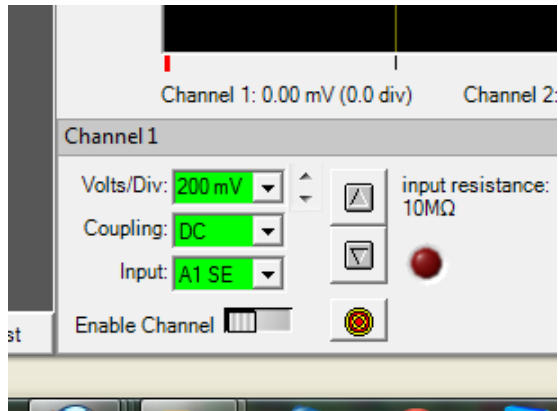


A1+ is one of the two inputs for the oscilloscope and A2+ is the other. If you wish to still be able to hear the audio signal from your MP3 player, connect your headphones or powered speakers to the headphone jack located at the corner next to A1+, as shown in the figure at the left.

Instructions on how to set up the Mobile Studio to make audio measurements follow, but remember that you will have to enable audio if you wish to also hear the signals. This is the best way to use the Mobile Studio since hearing the music or other audio signals is a lot to the experience.

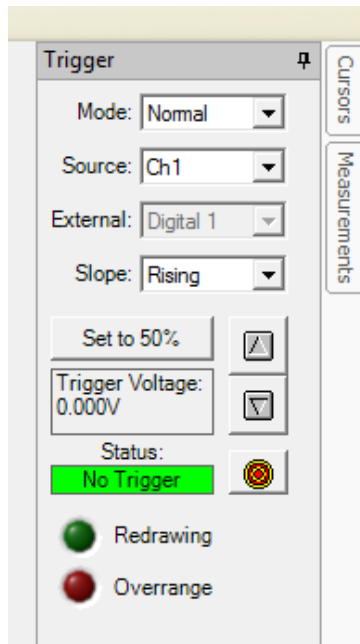


Shown above is the Mobile Studio Desktop display before the signals from the MP3 player are displayed. The Oscilloscope button at the left was clicked on to choose this display. Set up the two scope channels as shown below. Given typical values for output signals from MP3 players, 200mV/Div for the vertical scale will work well. Choose DC coupling, which allows very low frequencies to be displayed and choose A1SE for the input. The last selection is for the way the input signal is connected to the board, following the directions above. This measures the voltage between A1+ and GND. Use the same selections for channel 2, except use A2SE for the input.



For the time scale, choose 2ms/Div which does a reasonable job of showing the structure of a typical music signal. Make sure that the trigger is set up as shown. The trigger selects where the display starts. This is in the upper right hand corner of the screen.

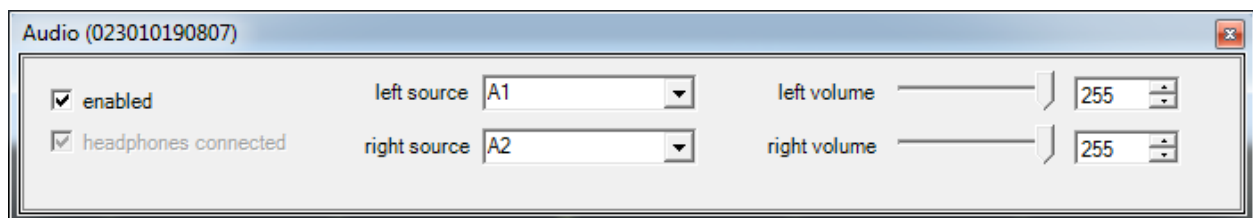
To be able to hear the audio signal, click on the Audio button at the left.



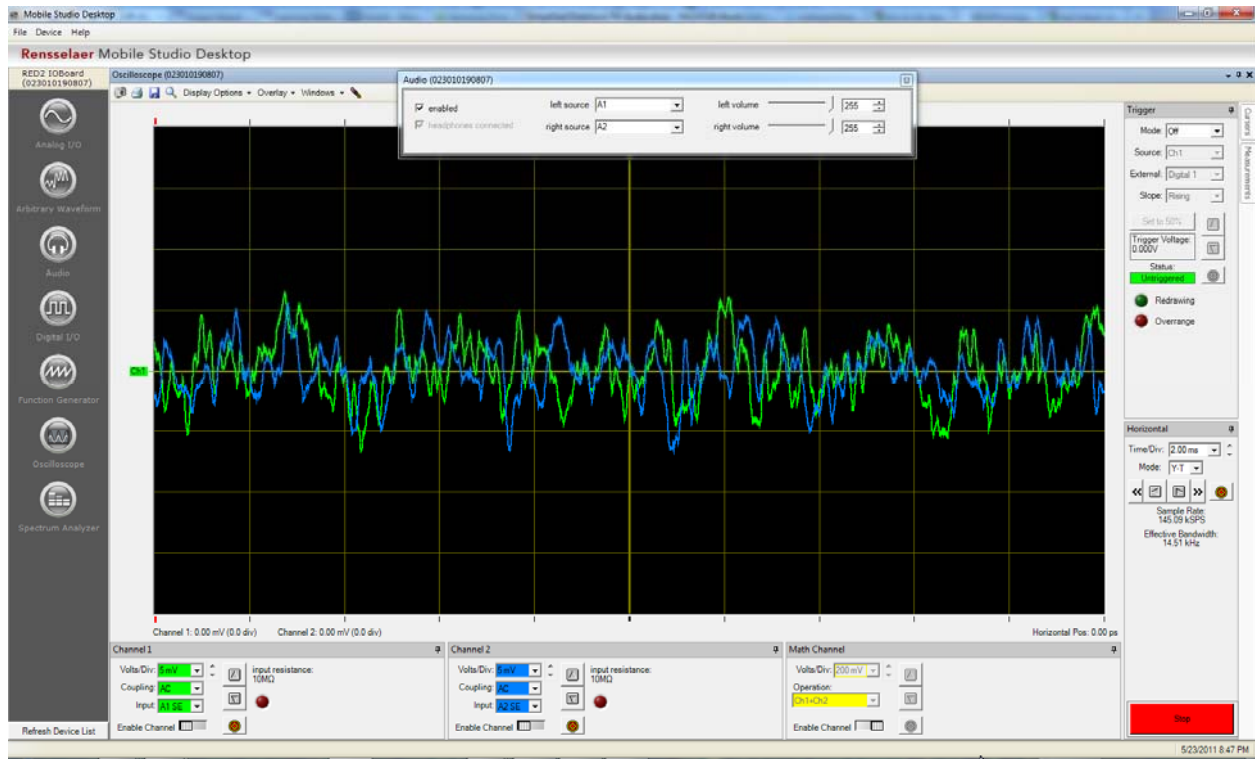
Be sure that you have selected A1 and A2 as the sources for the audio to be listened to. These are the two input channels you selected for the oscilloscope display.

Also, be sure that the enabled box is selected. Once you have made this selection, you should be able to hear the music.

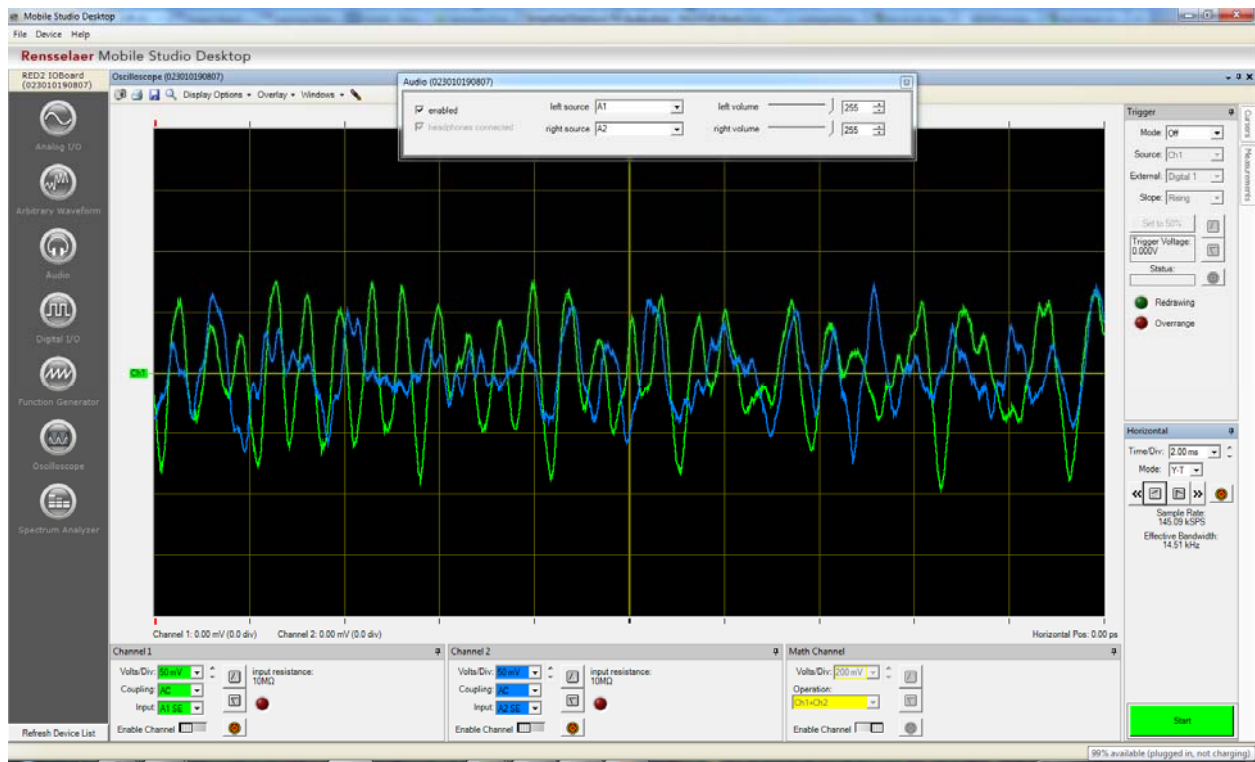
Adjust the volume so you can hear the music from your MP3 player. You will also have to adjust the voltage scale on the oscilloscope to be able to easily see the changing voltage as the music plays. It is easier to make this work without making the sound too loud for your ears if you use powered speakers rather than earphones.



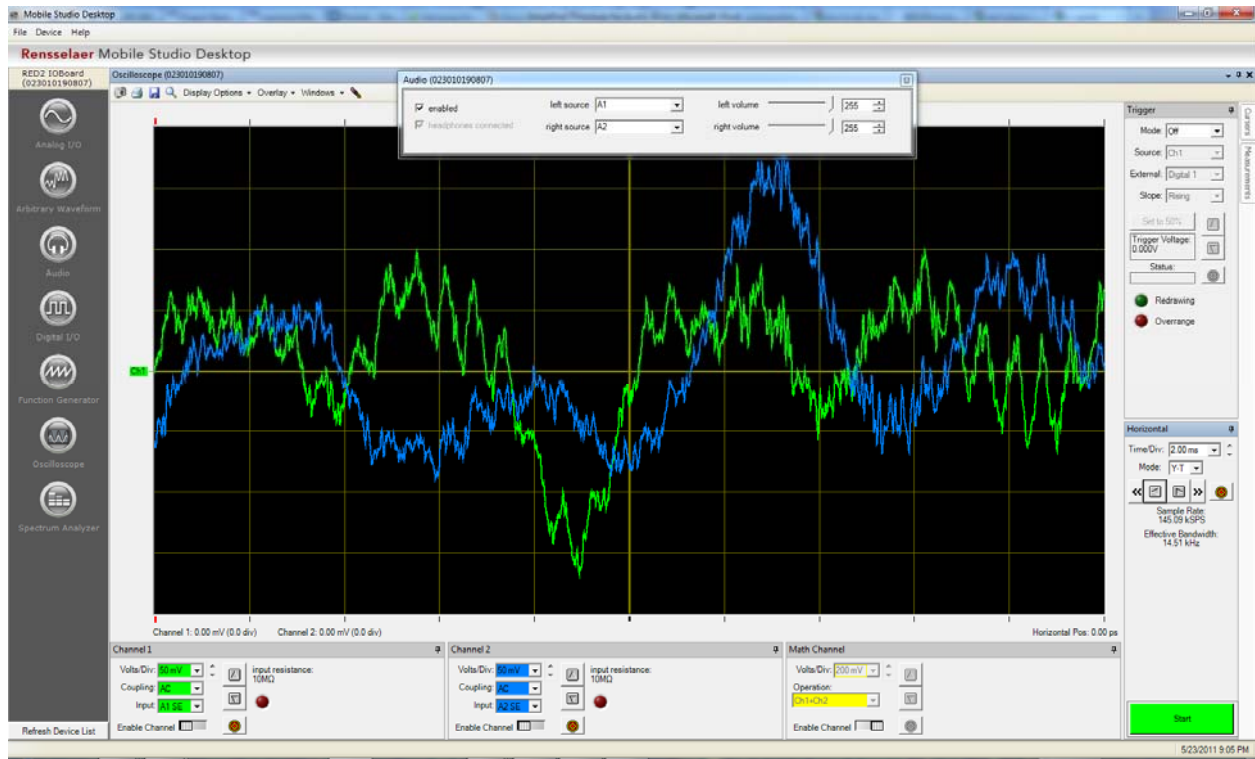
On the next page, we find the signal displayed on the oscilloscope for a few milliseconds of the Beatles' song Day Tripper. It is rather difficult to tell this from the time varying signal. Even different musical genre's are difficult to differentiate. Below Day Tripper is Sitting on Top of the World by Sweet Honey in the Rock, which is an a cappella group if you have not heard of them.



Beatles – Day Tripper

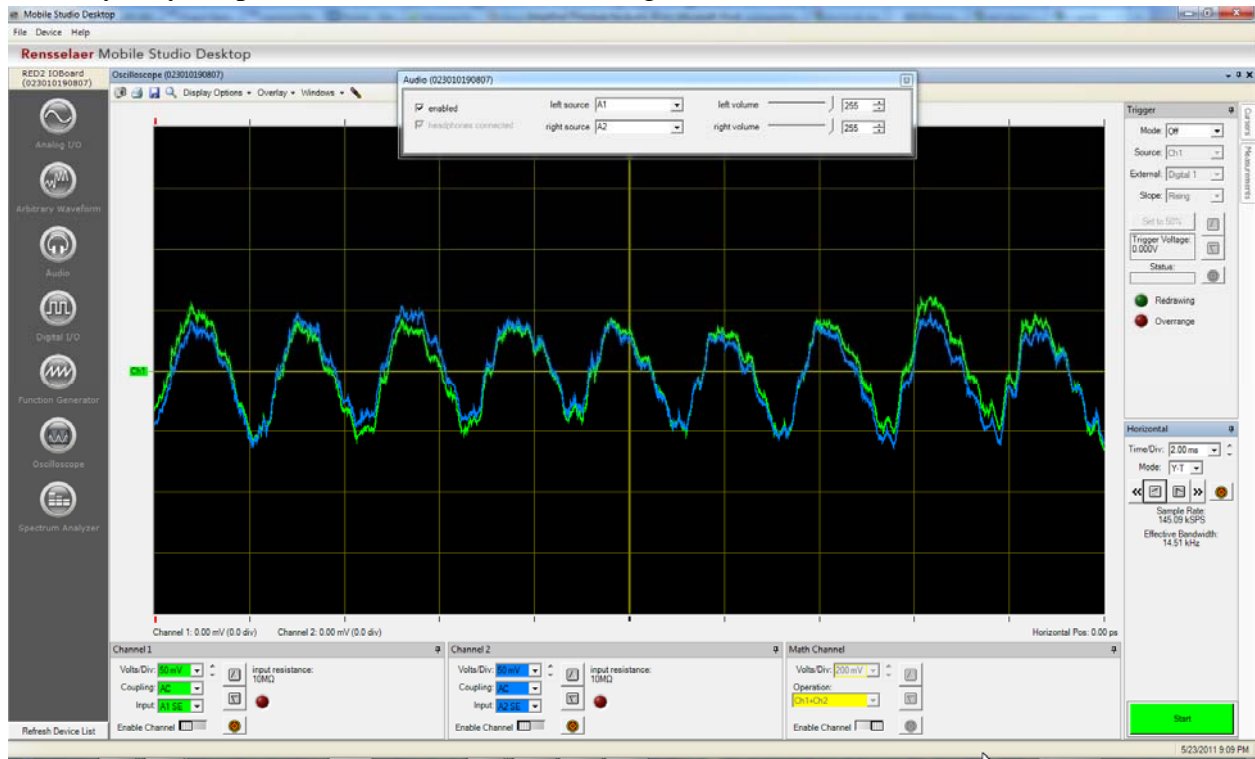


Sweet Honey in the Rock – Sitting on Top of the World



Tortoise – Six Pack

The only easy to spot difference is the much stronger bass in Six Pack.



The Ukulele Orchestra of Great Britain – Miss Di-na-mi-tee