

7.4: Procedure

1. On the front panel of the switchbox, plug the headphones into the headphone (mini-jack) output and connect the output BNC connector to the voltmeter. Set the voltmeter to read AC volts on its lowest range. Also set it to read in decibels by depressing the *dB* button.
2. On the back panel of the switchbox connect the output of the reference generator to input one of the switchbox with a BNC to BNC cable (the right side of the rear panel when viewed from the front). Similarly, connect the output of the second generator to input two of the switchbox.
3. Set the reference generator to a 1 kHz sine wave and adjust the amplitude to 500 mV peak-to-peak. Leave this as is for the remainder of the experiment.
4. Set the second generator to a 1 kHz sine wave and adjust the amplitude to 500 mV peak-to-peak.
5. Listen through the headphones. Flick and hold the toggle switch to the left to engage the second generator. Ideally, this should sound exactly the same as the reference tone.
6. If required, adjust the amplitude level of the second generator so that it sounds just as loud as the reference. Flick back and forth between the two several times for comparison. It sometimes helps if this is performed with eyes closed to remove visual distractions. Once the two levels are identical, listen to the second generator and depress the Reference button (*Ref*) on the voltmeter. The meter should now read approximately 0 dB. Record the precise value and any relevant comments in the first row of Table 1.
7. Set the second generator to 125 Hz. While comparing the reference to the second tone, adjust the amplitude (voltage) of the second tone so that the two tones sound as loud as each other. Make sure that you flick back and forth several times for a precise comparison. As these are pure tones, some people like to compare them on the basis of being “equally irritating”. Once the two tones have achieved equal loudness, listen to the second generator and record the decibel value in Table 1 along with any relevant comments. Make sure to include the + or – sign of the reading. A “–” indicates a decrease in required level and therefore an increase in hearing sensitivity. A positive value indicates the opposite situation.
8. Repeat step 7 for the remaining frequencies in Table 1.
9. Repeat steps 4 through 8 for the second lab partner using Table 2. Repeat and add a third table if there is a third lab partner.
10. Compare your results in Tables 1 and 2 to the ISO 226 standard graph (included after the data tables). For proper comparison, the headphone level is in the vicinity of 70 dB SPL. You may wish to plot your data using a spreadsheet. In doing so, make sure that you set the horizontal axis to a logarithmic scale.

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