

Supplemental Material (Chapter 6: Measurement of Vibrating Systems)

1. The piezoelectric effect is the transduction principle used in what type of microphone?
2. The capacitive effect is the transduction principle used in what type of microphone?
3. The electromagnetic effect is the transduction principle used in what type of microphone?
4. Match the following equipment types with the most appropriate function:

_____ Used to display the time waveform of a signal (amplitude across time)

A. Function Generator

_____ Used to produce different wave types (different signals)

B. Spectrum Analyzer

_____ Used to display the frequency content of a signal (amplitude across frequency)

C. Oscilloscope

Supplemental Material (Chapter 31: Production and Perception of Musical Tones)

1. What are the three broad classes of musical instruments?
2. A small instrument would be expected to have an attack time that is different than a larger instrument. How would the attack time of the small instrument be different?

Due: Thursday, March 29, 2001

4. Draw a high-pass filter with the following characteristics: $f_L = 2000$ Hz, attenuation rate = 12 dB/octave.

5. For each of the problems in this set, assume that you are dealing with a white noise that has the following characteristics:

Bandwidth (Δf) = 10,000 Hz

Over-all SPL = 90 dB re: 20 μ Pa

a. $L_{ps} =$ _____

- b. Calculate the SPL at the output of each of the following filters:

1) Band-pass filter: $\Delta f = 200$ Hz; $f_c = 400$ Hz

2) Low-pass filter: $f_U = 1000$ Hz

3) High-pass filter: $f_L = 9000$ Hz

4) 1-octave filter: $f_c = 1000$ Hz

6. For each of the problems in this set, assume that you are dealing with a white noise that has the following characteristics:

Bandwidth (Δf) = 5000 Hz

Over-all SPL = 80 dB re: 20 μ Pa

a. $L_{ps} =$ _____

Due: Thursday, March 29, 2001

b. Calculate the SPL at the output of each of the following filters:

1) Band-pass filter: $\Delta f = 200$ Hz; $f_c = 400$ Hz2) Low-pass filter: $f_U = 1000$ Hz3) High-pass filter: $f_L = 4000$ Hz4) 1-octave filter: $f_c = 500$ Hzc. A white noise is analyzed with a 1-octave filter at four preferred center frequencies. The **octave-band level** for 125 Hz is 35 dB SPL re: 20 μ Pa.1) Calculate the following **octave-band levels**.

f_c	dB SPL
125	35
250	_____
500	_____
1000	_____

2) What is the L_{ps} for the noise?