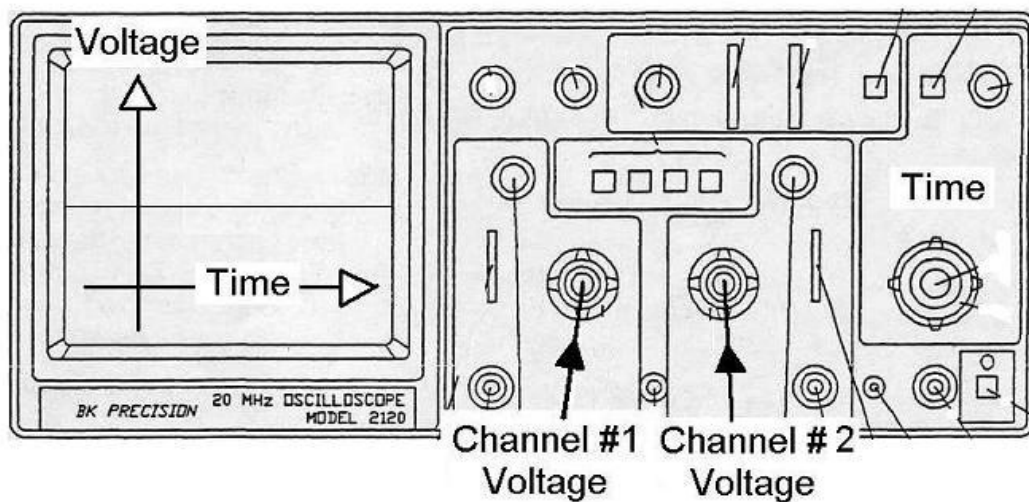


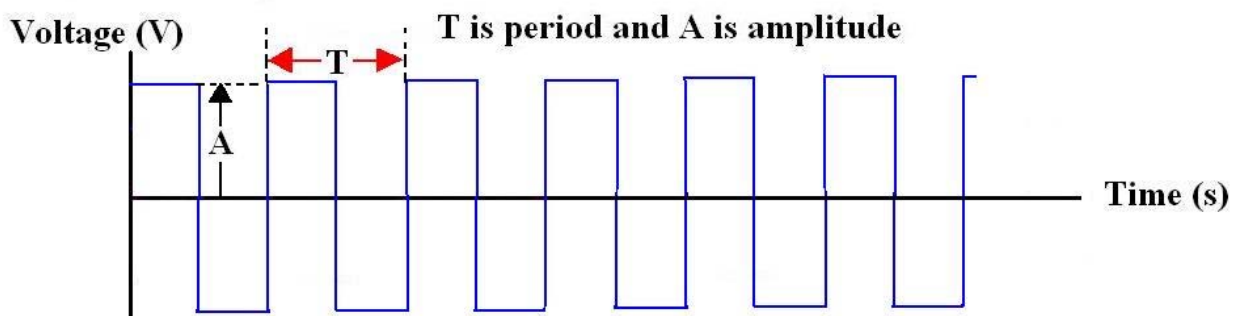
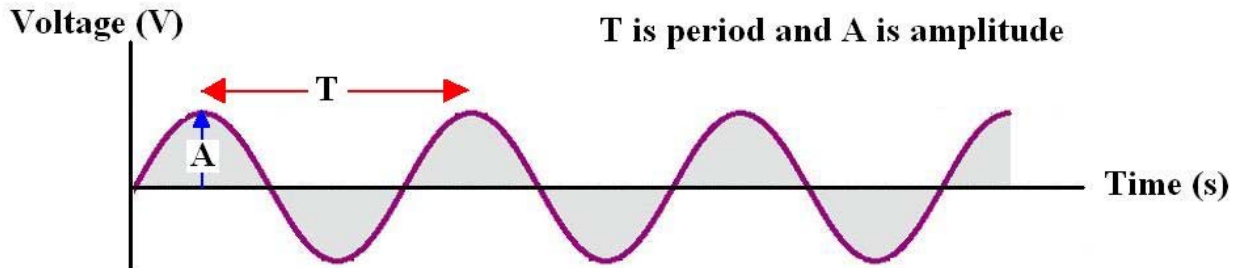
Experiment No. 3

Oscilloscope and Function Generator

An oscilloscope is a voltmeter that can measure a fast changing wave form.



Wave forms



A simple wave form is characterized by its period and amplitude. A function generator can generate different wave forms.

Part 1 of the experiment (together)

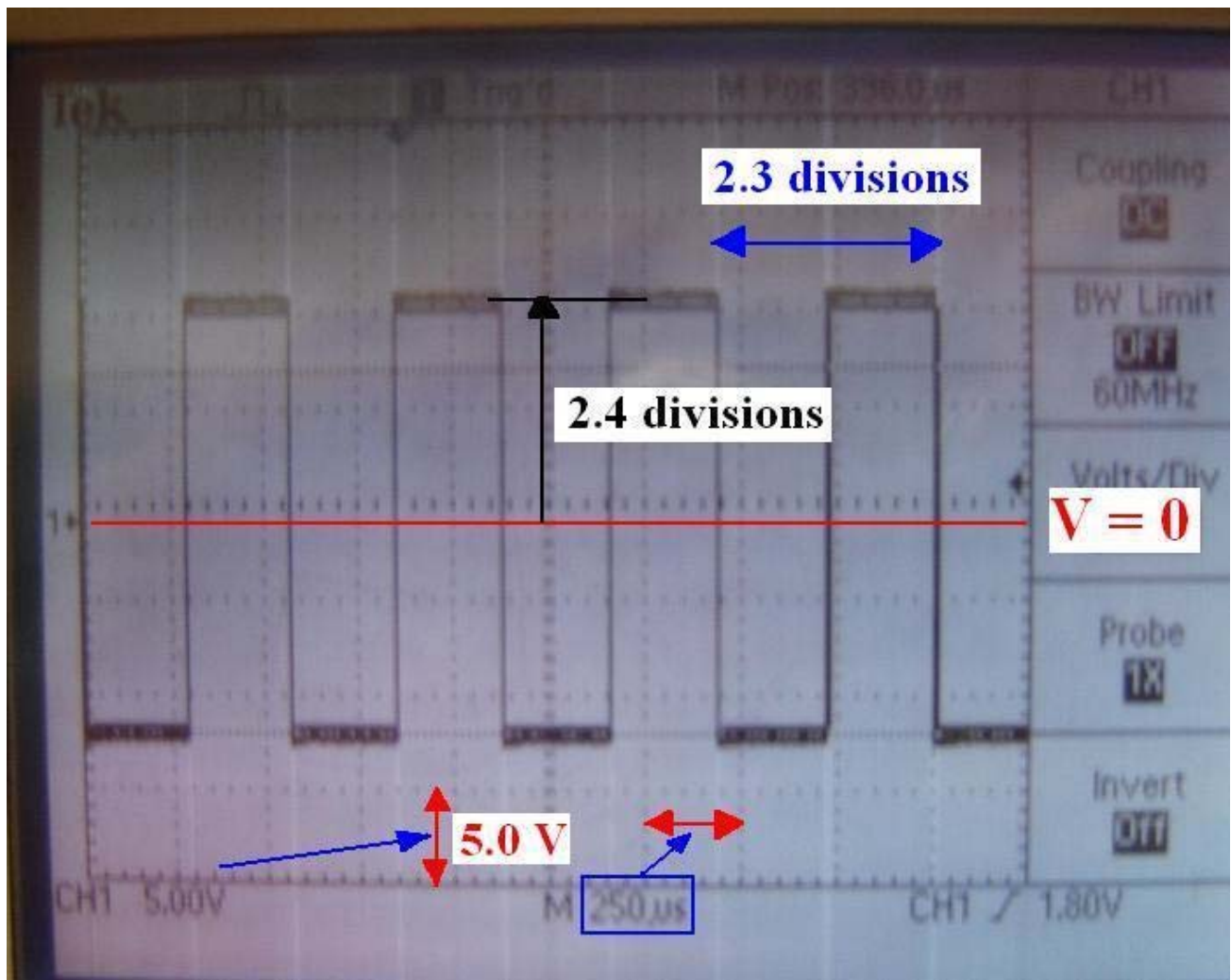
Generate a square wave of frequency of 1.8 kHz with the function generator.



Measure the amplitude and frequency with the Fluke DMM.



Measure the amplitude and frequency with the oscilloscope.



The voltage amplitude has 2.4 divisions. Each division means 5.00 V. The amplitude is $(5)(2.4) = 12.0$ V.
The Fluke reading was 11.2 V.

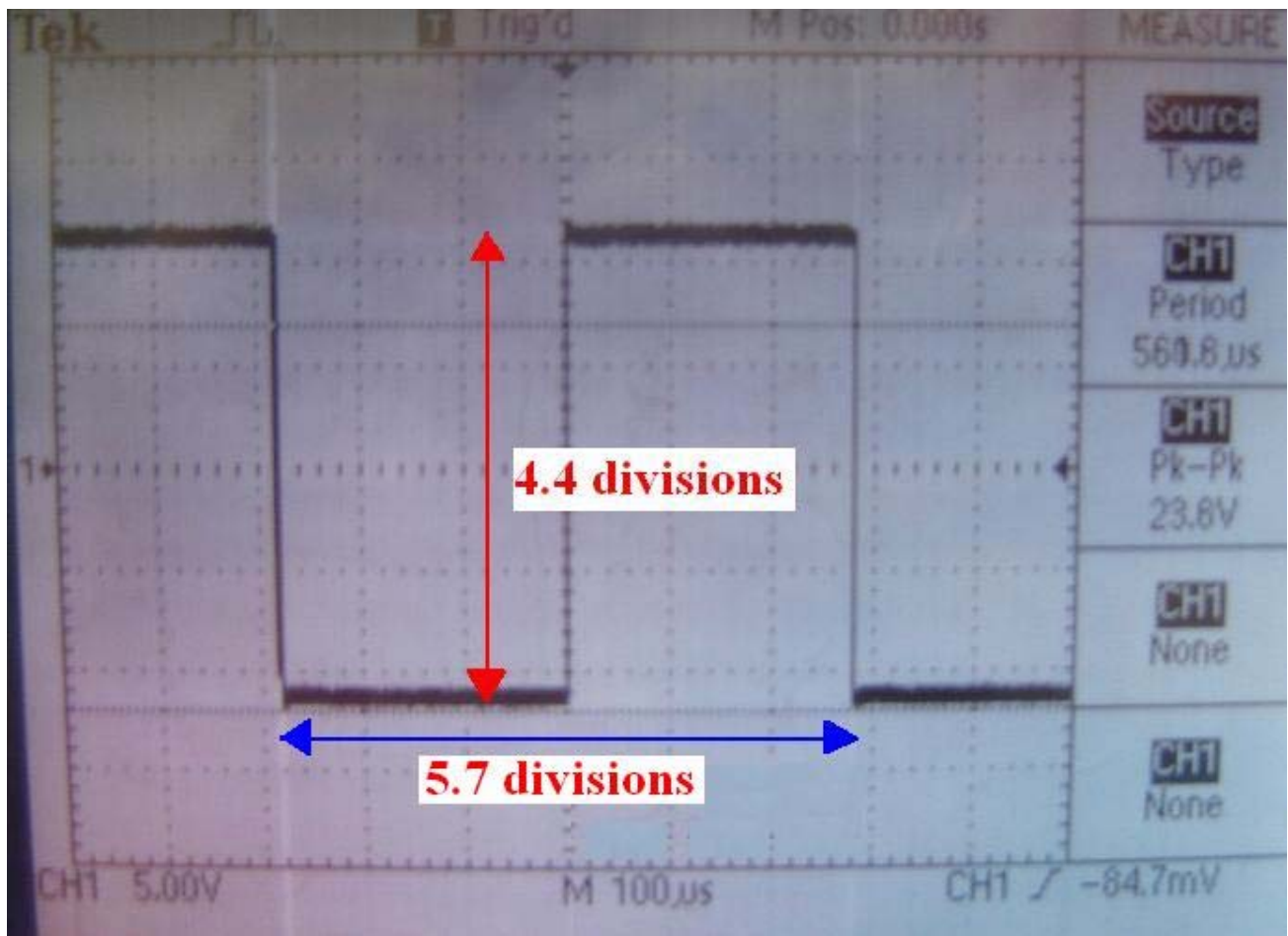
The period (T) of the wave has 2.3 divisions. Each division means 250 μ s. The period is $(2.3)(250 \mu\text{s}) = 575 \mu\text{s}$.

The frequency of the wave = $f = \frac{1}{T} = \frac{1}{575 \times 10^{-6}} = 1739 \text{ Hz}$

The Fluke reading was 1783 Hz

The error is at least ± 0.05 divisions.

The accuracy can be improved by displaying the wave form bigger.



Now, we have two amplitudes = 4.4 divisions.

One amplitude = 2.2 divisions.

Each division = 5.00 V. One amplitude = 11.0 V

Fluke reading was 11.2 V

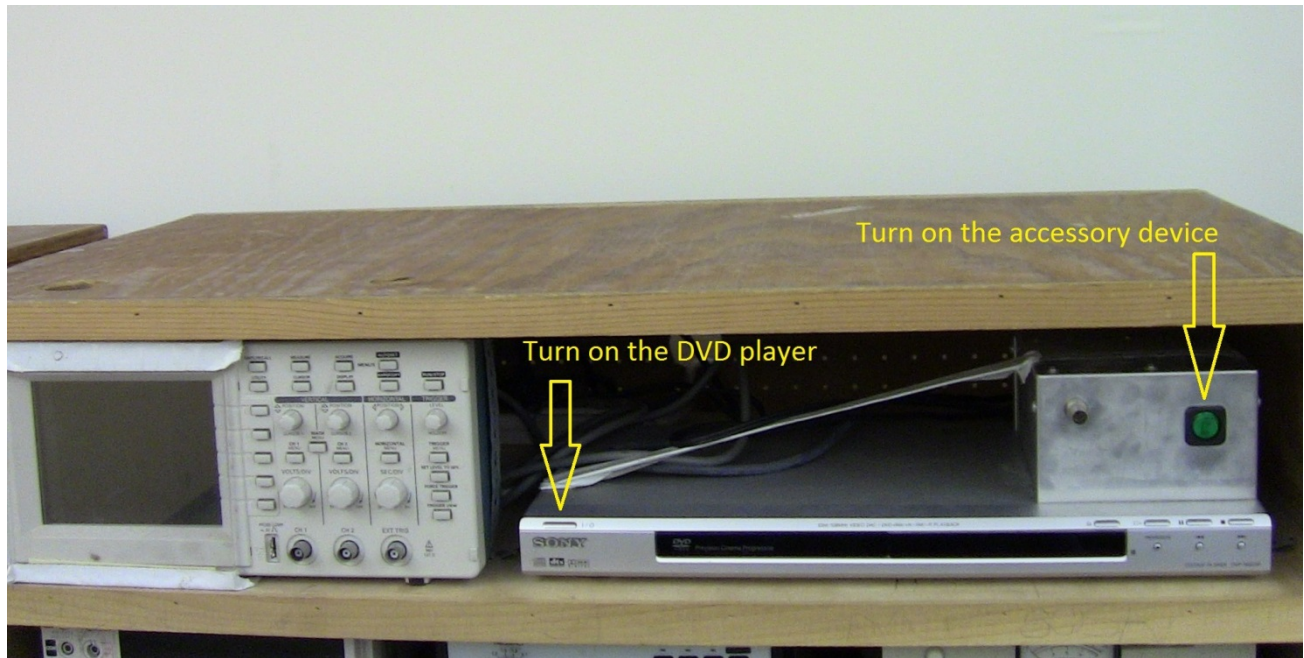
T = 5.7 divisions. Each division = 100 µs.

T = 570 µs. Frequency = 1754 Hz

Fluke reading was 1783 Hz.

It was always better to get a bigger display.

Part 2 of the experiment -Measuring signals from the DVD player.



Next turn on the DVD Player and turn on the accessory device that is attached to the top of the DVD player. Connect the output of the accessory device to the oscilloscope. Select 'Track 6' on the DVD Player, and push 'Play'. Once you have optimized the waveform on the oscilloscope, use a pencil to sketch the waveform on the datasheet. Next, report the measurements of this waveform on the datasheet. (Remember that 1 period is the amount of time for a signal to repeat.)

Repeat these measurements for 'Track 7' and 'Track 8'.

Name _____	Console _____	Partner _____	Date _____
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First Waveform, 1.8 KHz, amplitude knob fully clockwise, 30 db button popped out

DMM readings for first waveform. Amplitude _____; Frequency _____

Amplitude from oscilloscope, first waveform.

of Divisions (vertically) _____ Volts/Division _____

Calculated Amplitude _____

Frequency from oscilloscope, first waveform.

of Divisions (horizontally) _____ Seconds/Division _____

Period _____ Calculated frequency _____

**Second Waveform, 9 KHz, amplitude knob fully clockwise,
push in the 30 db button**

DMM readings for second waveform. Amplitude _____; Frequency _____

Amplitude from oscilloscope, second waveform.

of Divisions (vertically) _____ Volts/Division _____

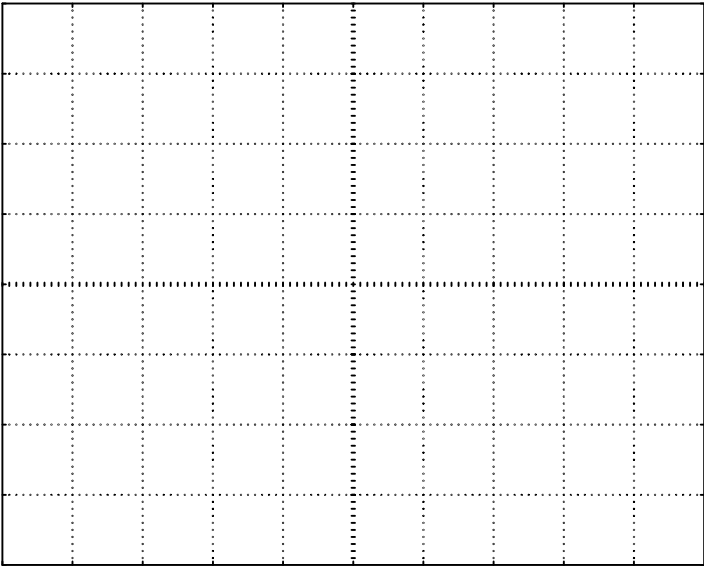
Calculated Amplitude _____

Frequency from oscilloscope, second waveform.

of Divisions (horizontally) _____ Seconds/Division _____

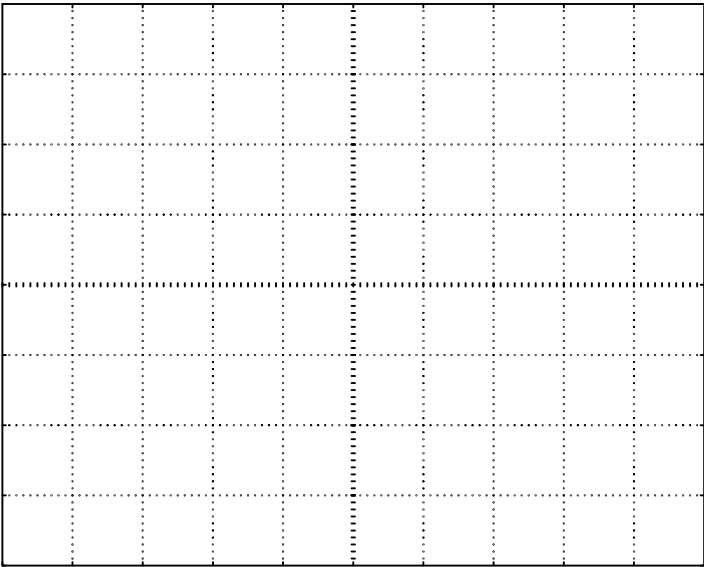
Period _____ Calculated frequency _____

Name _____



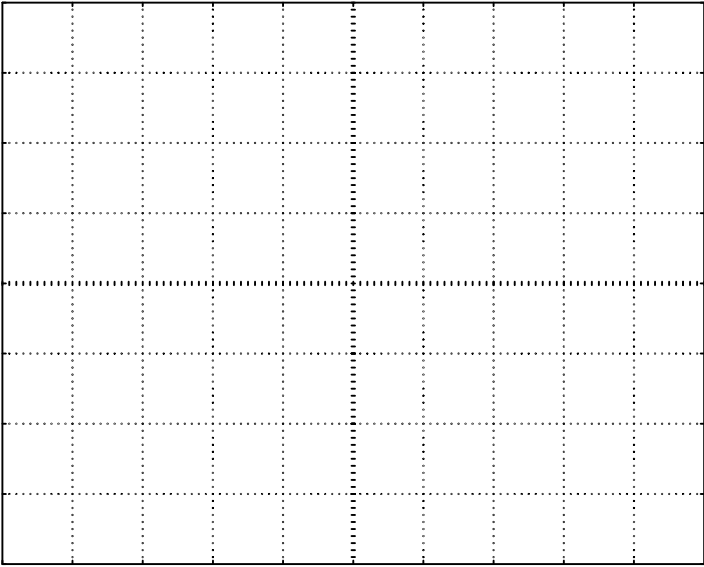
Track	# of Divisions (vertically)	Volts /Division	Calculated Amplitude (in Volts)

# of Divisions (horizontally)	Seconds /Division	Period, T (in seconds)	Frequency, $f = 1/T$ (in Hz)



Track	# of Divisions (vertically)	Volts /Division	Calculated Amplitude (in Volts)

# of Divisions (horizontally)	Seconds /Division	Period, T (in seconds)	Frequency, $f = 1/T$ (in Hz)



Track	# of Divisions (vertically)	Volts /Division	Calculated Amplitude (in Volts)

# of Divisions (horizontally)	Seconds /Division	Period, T (in seconds)	Frequency, $f = 1/T$ (in Hz)