**THE OSCILLOSCOPE**

Aditya Balwani

PARTNER: Michelle Chan

PHY 134

SECTION 07

TA: PETER JONES

DATA TAKEN: 09/17/2014

LAB DUE: 09/22/2014 at 10:00AM

LAB HANDED: 09/22/2014

**Aim:**

To learn how to use and understand the functioning of an Oscilloscope with the aid of 2 function generators and to find the Voltage of a battery using the Oscilloscope.

**Apparatus:**

1. Oscilloscope
2. Dry cell battery
3. 2 Digital Function generators
4. Test Leads for making connections

**Procedure:**

First we must connect turn the oscilloscope on and try to get a straight line through the center. Then we connect the battery to the Oscilloscope and find the right scale and use the V/div to find the V of the battery. We then disconnect the battery and connect the first function generator and set it to a 1Khz sin wave. Measure the period of the sin wave and amplitude. Compare the 2 to make sure they fall within the uncertainty ranges. We then set triggering to negative and notice any changes for sin, tri and square waves. Finally connect the second function generator and create a Lissajous figure.

**Data Analysis:**

Using the collected data we find that the voltage of the given battery was 1.5Volts. With the frequency of the generator at 189.3Hz we got the period of the wave to be 5.3divs += 0.2 divs which gives 5.5ms += 0.2ms. The amplitude of the wave was 0.98V

**Q1) Do the 2 frequencies follow the uncertainty?**

Yes, with we had the frequency set to 189.3Hz and with the period [181.18 Hz, 196.07Hz]

**Q2)**  **What happens when you set trigger to negative.**

Triggering allows you to horizontally align a wave with repetitions of the signal. This allows a repeating wave to be overlaid on top of itself. Setting trigger to negative flips the signal.

**Q3) Why is there not much change in square wave?**

Because in a square wave, there is no variable voltage, it just switches from one voltage to the other without transition

**Q4) What happens when you turn a signal off?**

On turning a signal off, it turns into a straight line at zero and we get one single wave on the display

**Q5) Explain Lissajous Figures**.

Lissajous figures are formed on certain combinations of the 2 frequencies of the generator. When the 2 are equal we get a circle because of the resonance between the 2 frequencies. We get different figures at different resonances between the frequencies.

**Conclusion:**

Using various experiments we learnt how to use an oscilloscope and find the voltage of a battery.