ELT 101: Basic Electricity: AC/DC

LAB 5-2: The potentiometer

Objectives

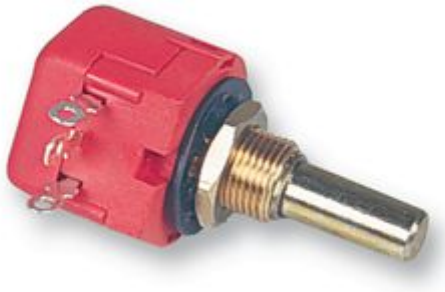
1) Become familiar with a potentiometer

2) Measure the range of resistance on a potentiometer

3) Identify whether a potentiometer has a linear or audio taper

4) Utilize a potentiometer to create varying voltages

Equipment and materials



1) Safety glasses

2) Fluke 179 DMM

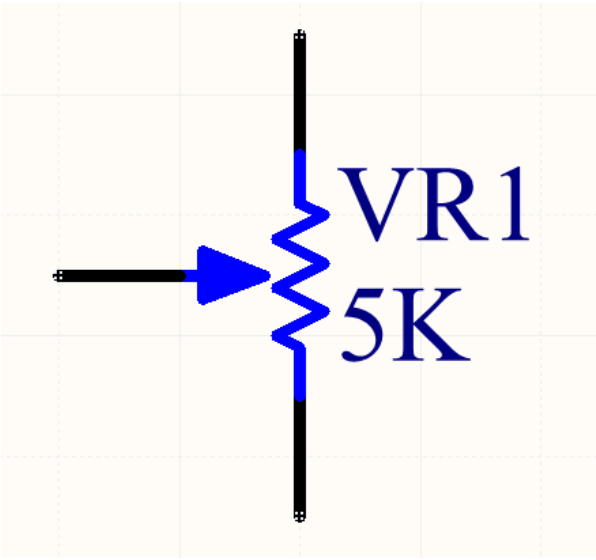
3) Electrical trainer

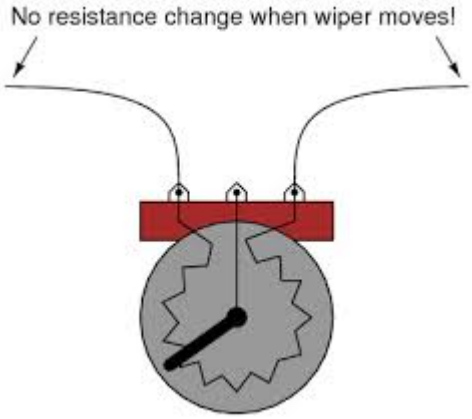
4) Jumper leads

Procedure 1: Becoming familiar with potentiometers

1) Note the schematic symbol for a potentiometer shown below.

2) A potentiometer is a three-terminal variable resistor. The total resistance of the potentiometer is available on its outer terminals. The middle terminal is the viper arm and this is where a varying resistance is available typically ranging from 0 ohms up to its maximum rated value.





Procedure 2: Measuring the range of a potentiometer

1) Complete the pre-use tests on the Fluke 179.

2) Set the Fluke 179 to read resistance.

3) Connect the meter leads to the outer terminals of the potentiometer on the trainer board and record the resistance below

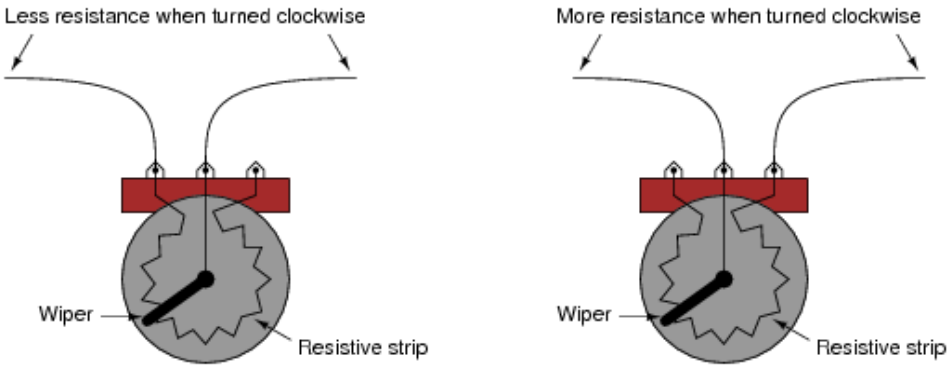
R = _____

4) Vary the wiper arm. What happened? Why?

_____

_____

5) Move one of the probes to the middle terminal as shown below.



6) Vary the wiper arm. What happens?

_____

_____

Procedure 3: Determine the type of taper of the potentiometer

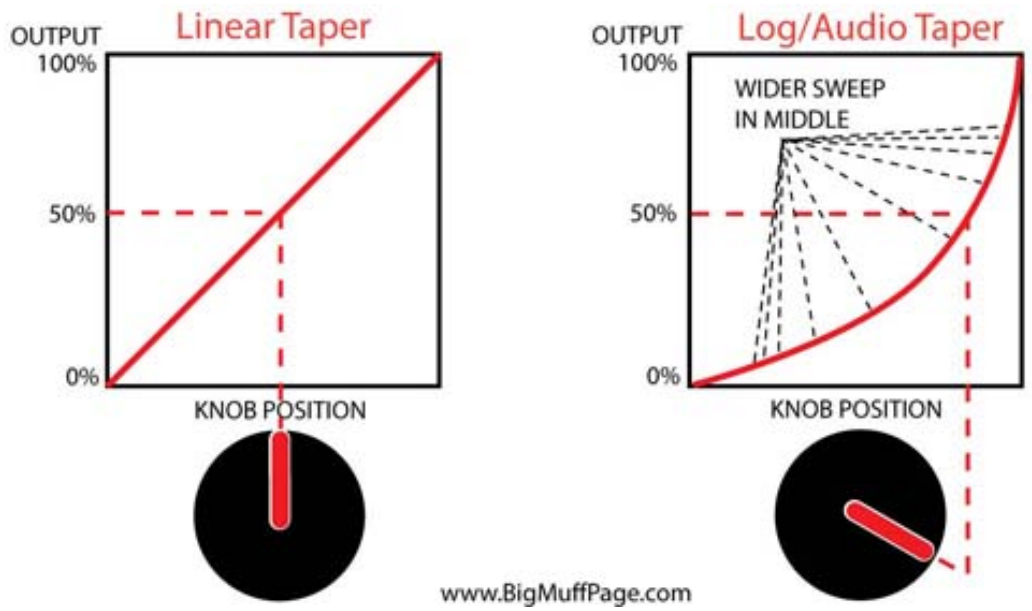
1) Record the resistance range of the potentiometer. _____

2) Find the mid point of travel of the wiper arm; record the resistance. _____

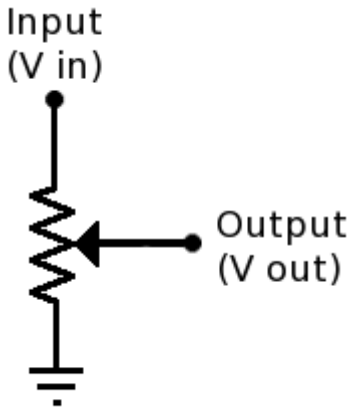
3) Is this potentiometer an audio or a linear taper? Hint: see the illustration on the next page. Why?

_____

_____



Procedure 4: Utilize a potentiometer to create varying voltages



1) Plug in your trainer and make sure both power switches are off.

2) Connect the circuit shown on your trainer board.

3) The outside terminals of the potentiometer are connected to the red and black 5V binding posts.

4) The middle terminal is connected to your meter.

5) Set your DMM to read DC volts.

6) Turn on the main power and then the 5V/12V power.

7) While observing the meter, vary the potentiometer.

8) What happens?

_____

_____

_____

9) So as you can see, a potentiometer allows us to produce varying voltages and resistances.

10) Can you think of a common application for one of these?

_____

_____

****** end of lab 5-2 ******