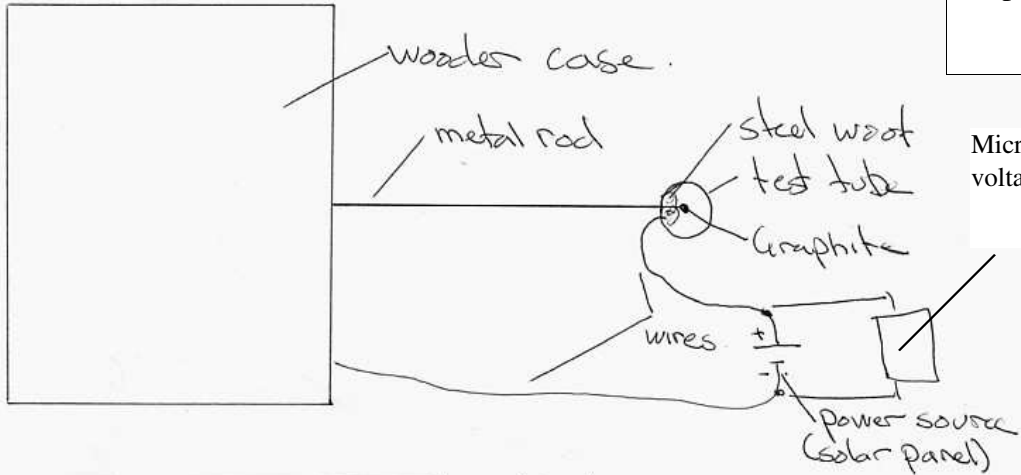
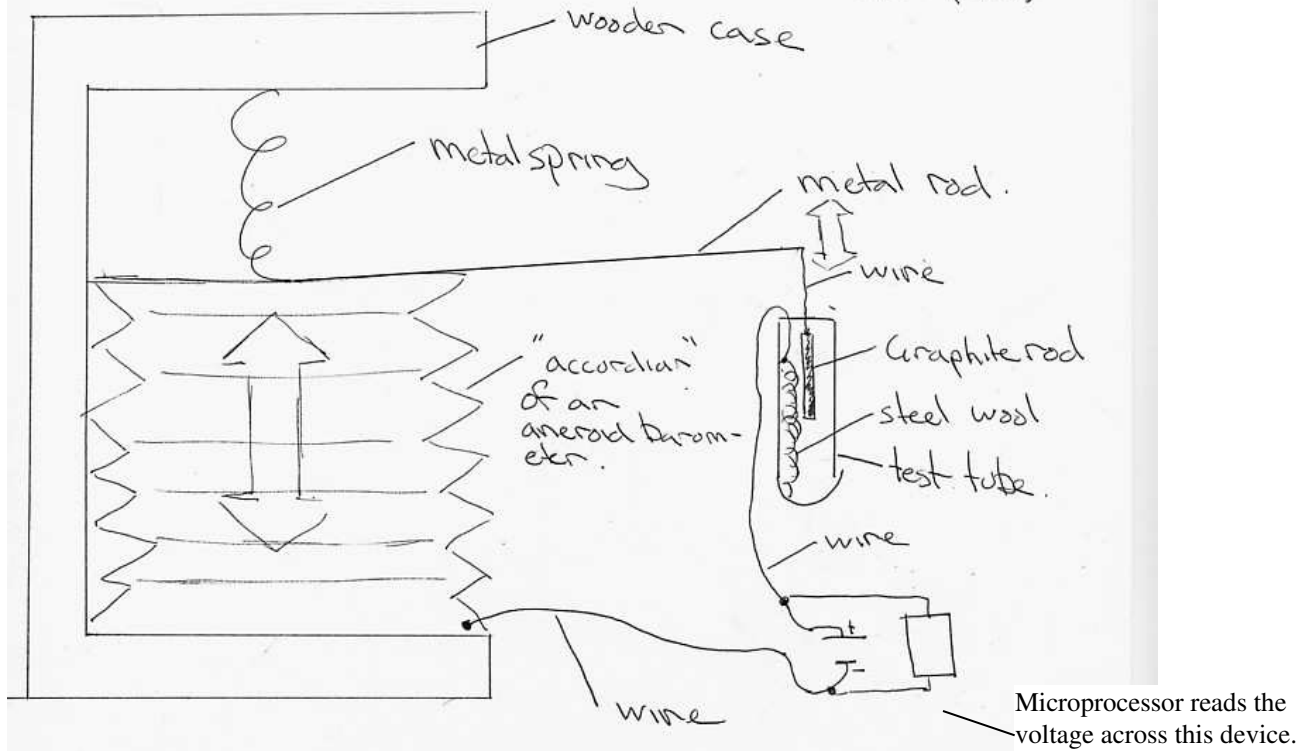


Barometer

Top view



Microprocessor reads the voltage across this device.

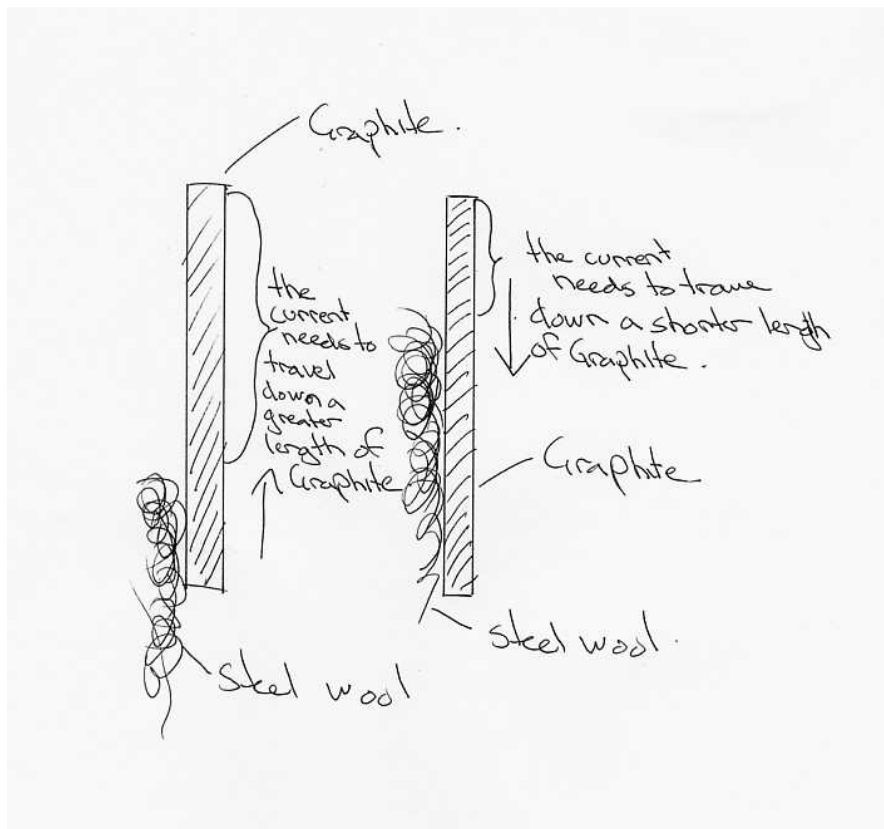


Microprocessor reads the voltage across this device.

Side view

Description:

This device measures the air pressure using the “accordion” of an aneroid barometer. This “accordion” expands and contracts with changes in the air pressure (high pressure pushes down on the device and contracts it, low pressure sucks the device outwards, thus expanding it) This movement is transferred to a metal rod. Attached to this rod is a stick of graphite, a semi-conductor. As the metal rod moves, the graphite is moved vertically against a piece of steel wool. A current is passed through the graphite and steel wool. As the graphite moves “down” the steel wool, more of it is in contact with the wool and thus the current needs to travel down a shorter length of graphite to reach the conductive steel wool, reducing the resistance of the device (see diagram below). This change in resistance can be measured by the microprocessor and thus we can determine the atmospheric pressure.



Construction details:

We plan to use the accordion, spring and wooden frame from a regular aneroid barometer, as this is a precise component- the spring must be perfectly calibrated. The metal rod is a piece of a metal coat hanger, as the rod must be very light, conductive (as the current is passed through it), but does not need to be very strong, as the graphite is akin in size to pencil lead and thus is not very heavy. The metal rod will be soldered onto the accordion, as will be the wire leading to the power source. The wire connecting the

rod to the graphite will be soldered, as will the wire connected to the steel wool. The wooden frame, spring and accordion will be external, as to increase it's exposure to the outside pressure. The rest of the components will be inside a tofu container, with a slit to allow for the insertion/movement of the metal rod. All of the external wires (those leading to the accordion) will be insulated, exterior wires (the type found in exterior Christmas lights). We plan to calibrate this device by using another barometer and recording what the resistance of the device is for each millibar.

Statistics:

Cost/ parts list

Part	Cost
Aneroid barometer (accordion, wooden frame, spring)	\$50.00
Coat hanger (Metal rod)	free
wires	\$0.50
Test tube	Free (from lab)
Graphite	Free (from pencils)
Steel Wool	Free
Total	\$50.50

Durability: The wooden frame, spring and accordion will be fine outside, the wooden frame protecting the metal components from precipitation. Tofu containers are very durable and thus the components inside it will be well protected. The wires that are outside will be durable enough, as the types we are using (the type found in Christmas lights) are very durable.

Feasibility and simplicity: This design is very complicated and expensive and the parts needed are not readily available.

Accuracy: This device will be very accurate as it does not involve liquids, unlike a mercury barometer. This reduces inaccuracies due to evaporation and heat (liquids tend to expand more than solids when heated)

Power demand: This device needs a lot of power, as it will need to pass a current through about 3 inches of graphite, a semi- conductor. The resistance of the graphite will cause the device to need more power.