# TOUCHSCREEN SENSOR

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Touch screen concept

A touch screen is an input device that allows user to enter information into the computer by simply touching the screen of the monitor. To be able to develop such a device, one must find a way to interact or connect a simple touch of a hand and with the monitor. Designing a circuit that could be activated by a simple touch can do this. This circuitry is then connected to the monitor.

The circuit must have a touch point that will be connected by a finger that has a resistance of 500k-1M ohm. It should also have two output terminals, corresponding to the x and y-axis of the screen. The circuit must output either 0 or 5 volts, corresponding to a logic low or logic high respectively.

The touch screen itself would look like the diagram in figure 1. Actual wires were placed on the screen. These wires were arranged such that it forms a grid on the screen. The end of each wire was then connected into the circuitry that would be designed later.
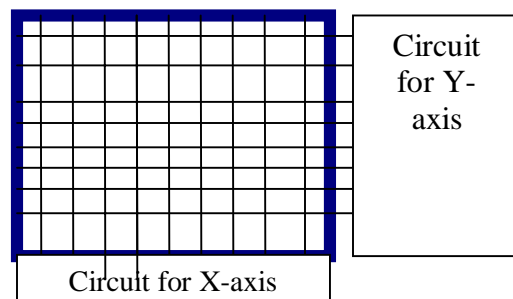
Circuit Design and assembly

The circuit is composed of two parts. The first part will be connected to the x-axis and the other to the y-axis. The circuit that is attached to the touch screen uses transistors as switches to be able to do its purpose. The circuit is shown in figure 1.

Initially, when the wires were not connected by the finger, the voltage at node 1 will be pulled up to 5 volts. If this is so, there would be no current flowing from the base to emitter junction, causing this transistor to be if in the cut-off region. Therefore, the transistor will be open. If this transistor is open, no current will flow to the collector junction, hence, to the base of the second transistor, again, causing the transistor to be in the cut-off region. With the second transistor open, the output voltage that would be read is 5 volts or logic high.

Same thing will happen to the second part of the circuit. The voltage at node 2 will be pulled down to 0. Therefore, no current will flow from the base to emitter junction. There would also be no collector current, hence no current will flow to the base of the second transistor causing this two transistors to be in the cut-off region. If this is so, the voltage that would be read is 0 volts.

However, if the touch point is touched by the finger, current will flow from node 1 to the finger to node 2. This would produce a base-emitter current and a collector current. The collector current of the first transistor will flow to the base junction of the second transistor, saturating the second transistor. If this is so, the second transistors, in each part of the circuit will be shorted. Therefore, the output voltage in output1 is 0 volts and the output in output2 will be 5 volts.

Figure 1: