Verizon FIOS TV Remote Controller

I chose a Verizon FIOS TV Remote Controller as my research device. I did so because I was curious about what type of signal was being used and how it was transmitted to the television.

I found the following components inside the device: infrared light emitting diode (LED), resistor, capacitor, transistor, ceramic resonator, integrated circuit (chip), 30 pin dual inline package (DIP), and printed circuit board. None of these components were TI parts.

Each component has its own function or plays a special role. The role of the infrared LED is to send a light signal to the television receiver that is read (Figure 1). The infrared light signal is used since it is invisible to the human eye. The infrared light used by this is special in which it doesn't emit heat. The television uses a photocell to read the transmissions. The photocell is a light-sensitive detector that converts the infrared light into an electrical signal.

The resistor is used to limit the current going through the remote. If too much electricity is outputted, it could destroy the other components such as the LED.

The capacitor is used to store electricity when it is connected to the batteries (Figure 2). It is mainly used to keep power running when the battery dies for a short amount of time.

The role of the transistor is to connect external circuits (Figure 3). It is made of semiconductor material and has three terminals that are used to connect the external circuit.

The ceramic resonator is used to control frequency in the infrared IED. This determines what channel your television will change to after pressing a certain button.

The integrated circuit, or chip, is used to send a specific signal out to the transistor to amplify it when a button is pressed (Figure 4). The chip is like a brain for the remote controller and controls what the remote does.

The 30 pin DIP is used to hold the chip in place and connect it to the circuit. This allows the chip to send the signals it is supposed to and is essential to a working controller.

Finally, the printed circuit board is the structure that holds these pieces together and forms the circuit. It has all the circuit wires pre-placed on it so that the remote is easily assembled.

In conclusion, I have learned that there are several components that all work together in even a simple device. They are all essential to a working device, each with its own role. This has resulted from years of trial and error with the product. Without even one of these components, the remote will not function properly and will be a flawed product. Inside any modern device is a team of components that work together to make it function. Teamwork is important for success in all adventures including the VEX competition.

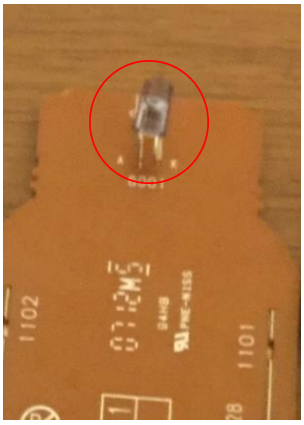

Figure 1: Infrared LED

The Infrared LED is circled. It is attached to the back of the printed circuit board.

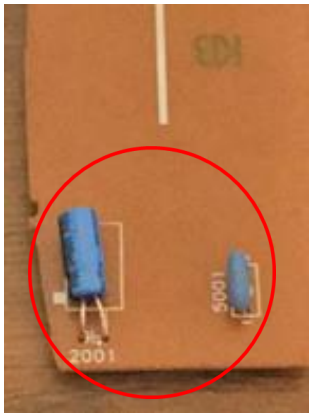

Figure 2: Capacitor

The capacitor is on the left and the ceramic resonator is on the right. Both are on the back of the circuit board.

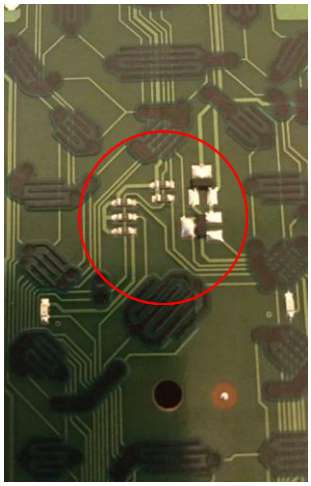

Figure 3: Transistor

The transistors are on the right and the resistors are on the left. All are attached to the printed circuit board.

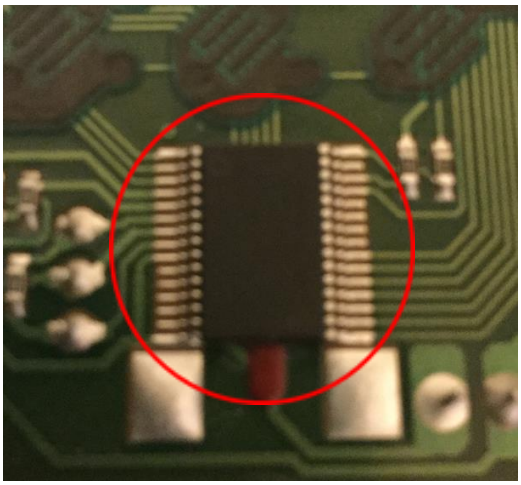

Figure 4: Integrated Circuit (Chip)

The chip is being held by the 30 pin DIP. This is attached to the printed circuit board.