Physics 398

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Final Project and Report

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The goal of my project was twofold. The first part was to glean a basic understanding of electronics so as to be able to build and experiment with different circuits. The second and more corporeal aspect was to build a fuzz or distortion effect pedal that would distort the guitar signal in a musically useful way.

My first goal was completed in the defining and understanding of the following terms: circuit, series circuit, parallel circuit, conductor, voltage, volts, current, ampere, resistance, resistor, capacitor, diode, transistor, integrated circuit, and ohm's law.

After several experiments, I ended up using a circuit that clipped the signal in a smoother way than the fuzz circuits did. My distortion box is made with two diodes: one silicon 1N34A and one germanium 1N4001. The transistor is 2N3904 NPN silicon.

I also experimented with a design that was based on the muff fuzz pedal by electro harmonix. In that circuit are two 2N5088/9 transistors and two 1N9148 or 1N34A diodes. This pedal did not have the sound I wanted and was eventually abandoned.

The finished circuit has only one extra feature, which is a volume control. The placement of the 100k variable resistor allows the entire output to be increased and decreased rather than altering the amount of distortion to the signal.

The knowledge I have gained will enable me to progress to more complex circuits that involve true bypass, tone control, effect output, and effect mix level.

Electra Distortion with Volume Control