Vex reverse engineering challenge

Flanger pedal, Desmond Keats 10012C West Vancouver

Introduction

For this challenge, I chose to reverse engineer a Flanger pedal. The Flanger pedal is a piece of equipment used to modify the sound emitted by a guitar. I chose this object because it was already broken and easy to disassemble, requiring nothing more than a simple screwdriver. The components were also very easy to identify and photograph, both internally and externally. All in all, it was among the best items to easily reverse engineer without any unwanted complications.



The flanger pedal

Components

As stated previously, the components of the flanger pedal are easy to find and identify. Starting with the external components, the Colour knob, the Range knob, and the Rate dial are used to adjust the harmonic effect. The On/Off switch is used to turn the device on and off, and the Filter/Normal switch allows the user to alternate between a normal flanger effect and a very full flanger effect.



Schematic showing the components of a flanger pedal

On the sides of the flanger pedal, there exists an input through which to connect a guitar, and an output in which to connect an amplifier.

On the inside, there are several electronic components which are instrumental in the functioning of this utility.



Inside the Flanger pedal

Among the larger components, there is the potentiometer, which acts as a larger resistor which can be controlled by the user. The potentiometer is usually in dials and knobs. Next, there is an LED, used to tell you if the device is on or not. Pretty straightforward, yet necessary.



Potentiometer

LED

Now onto the smaller parts. The diode is a part which lets electricity flow in one direction through a circuit. An LED is a type of diode which shines a light when energy is flowing through it. The resistor is used to narrow down the amount of electricity that passes through it. When used as a potentiometer, the user can modulate the amount of energy that passes through. The capacitor can store energy, and release it in quick bouts. It is often used to smoothen pulsing voltages. Finally, there is the integrated circuit, which has many functions. In fact, it is one of the key components in electronic devices. It can function as a plethora of things, such as a microcontroller or a timer.



A diode and an integrated circuit



A resistor (right) next to a capacitor(left)

Conclusion

During this project, I learned a great many things pertaining to reverse engineering and the components in a circuit board. I learned how to disassemble and reassemble a Flanger pedal, and despite it being relatively simple, it was still engaging to do. I learned how to identify numerous components on the inside and the outside of an electronic device, such as diodes, resistors, the Range dial, the input, potentiometers, and the On/Off switch.