

The Electric Guitar



Team Members: Allie Pokrywka, Georgia Mauch, Knox Chidsey, and Mila Hashemi

Team Number: 5164C

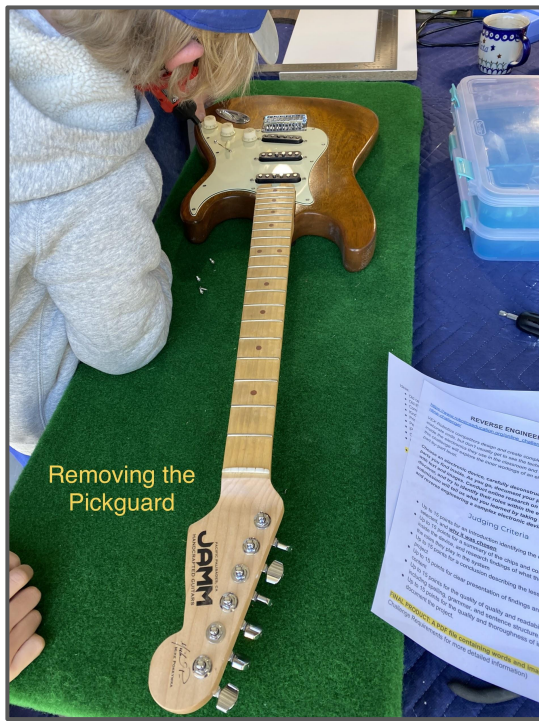
Location: Los Angeles, CA

Introduction

The electronic device we chose is an electric guitar. We chose this device because we all play it. We all found it very interesting to see how an electric guitar functions. It has many components needed to create its wonderful sound. Knox has played the electric guitar for four years, Allie for one year, Mila and Georgia, both for five years and all team members love playing.



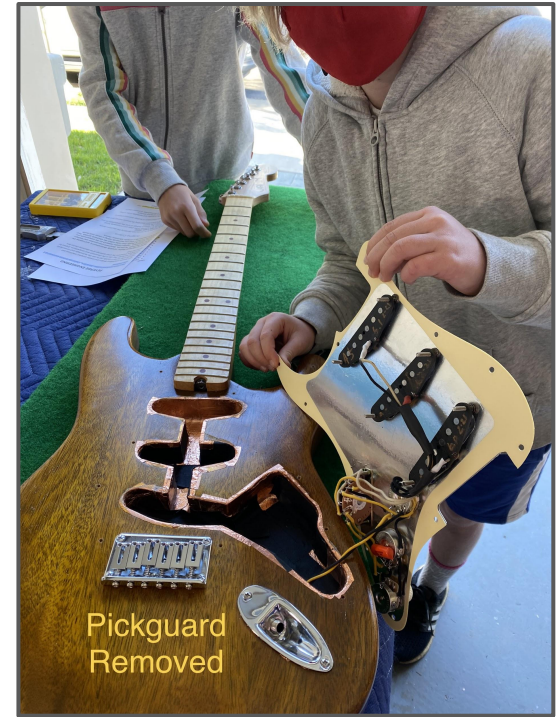
The Guitar Before Disassembled



Removing the
Pickguard



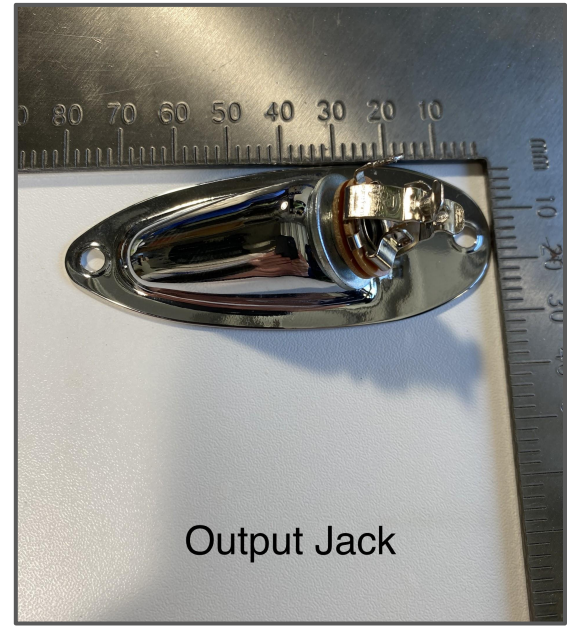
Removing the
Pickguard



Pickguard
Removed

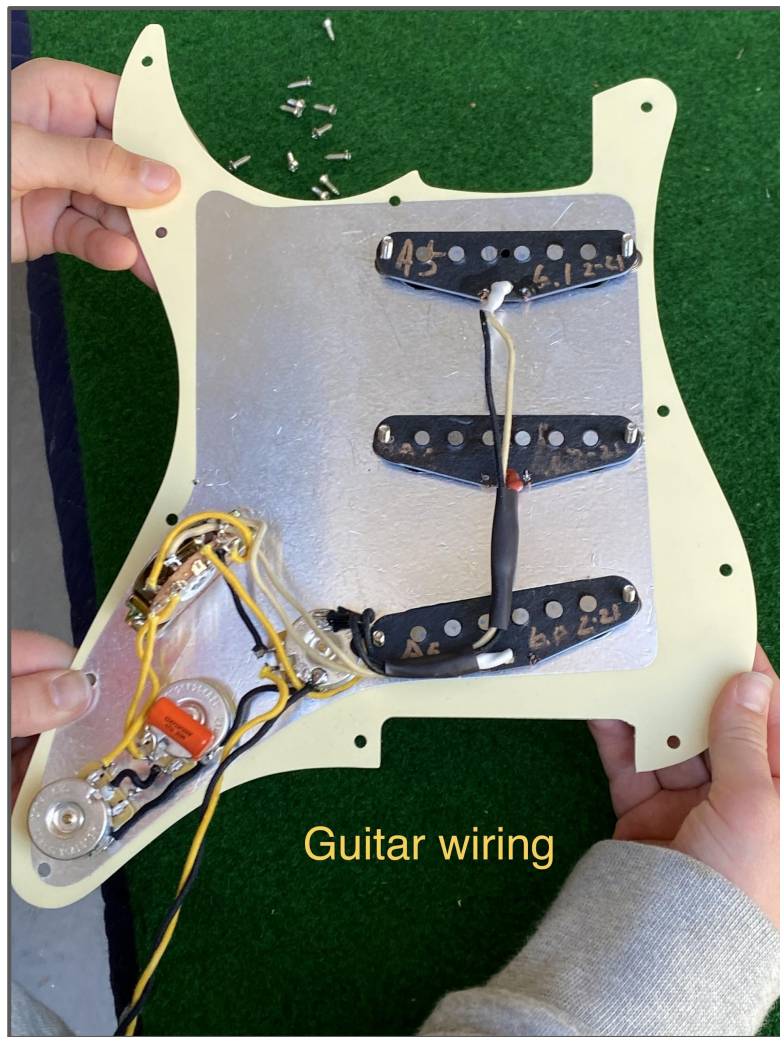
Pickguard

A pickguard is used to prevent scratches and chips on the finish of the guitar. The finish could be scratched by the nail of your hand. A pickguard is not needed, if you don't mind scratches and signs of wear.



Output Jack

The guitar output jack transfers the electrical signal from the guitar to and insulated cable so it can be sent to the amplifier. The guitar amplifier then amplifies the signal and makes the louder sound.



Guitar Wiring

The wiring directs the electrical signal made by the pickups through the 5-way switch, the volume and tone knobs, through the output jack along an insulated cable to the amplifier.

Ground Wires

Ground wires connect every piece of metal on your guitar. It also acts as a return path to the amp. The ground wiring helps remove unwanted noise and is essential for safety.

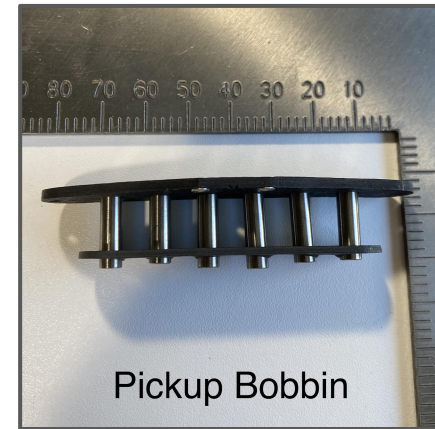
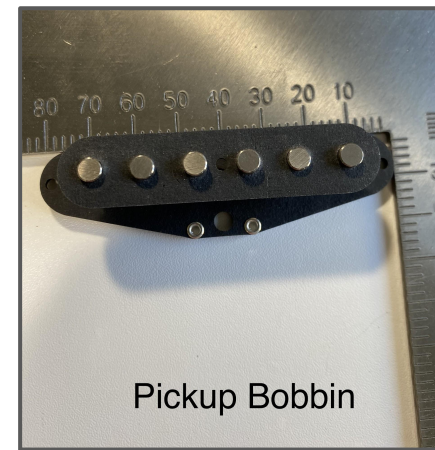
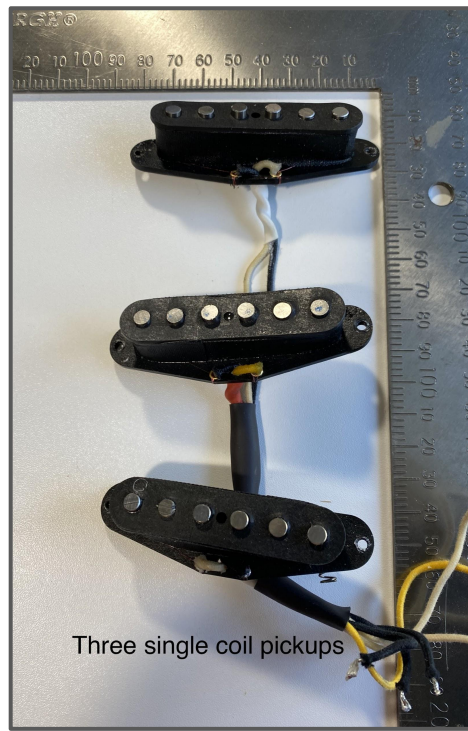


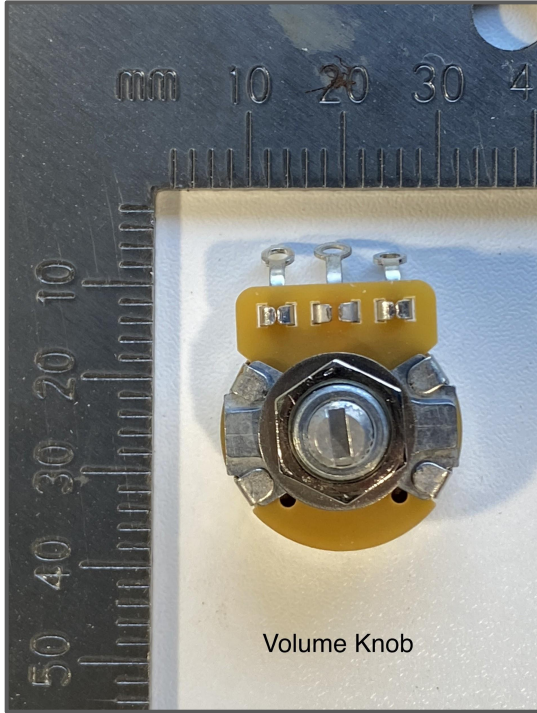
Removing ground wires
from volume knob



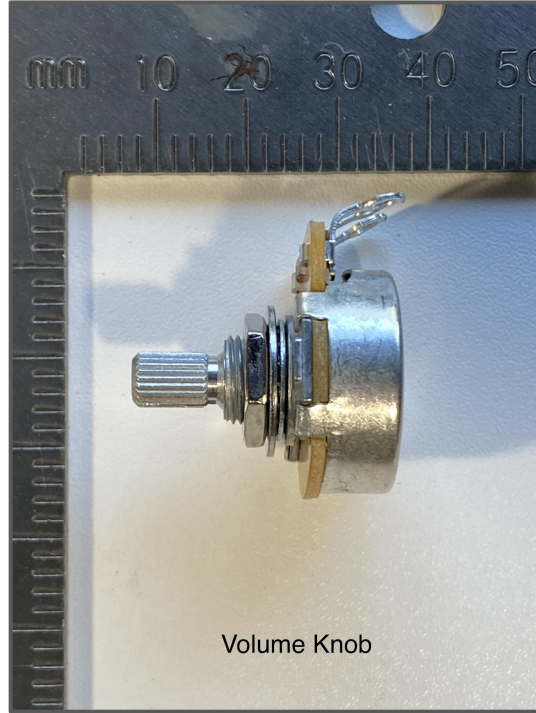
Pickups

A pickup converts string vibrations into a current and is in the body of the guitar under the strings. Pickups use wiring and coils to work. Six magnets are also used to better pick up the sound from the six strings of the instrument. Some pickups use metal rods instead of magnets.





Volume Knob



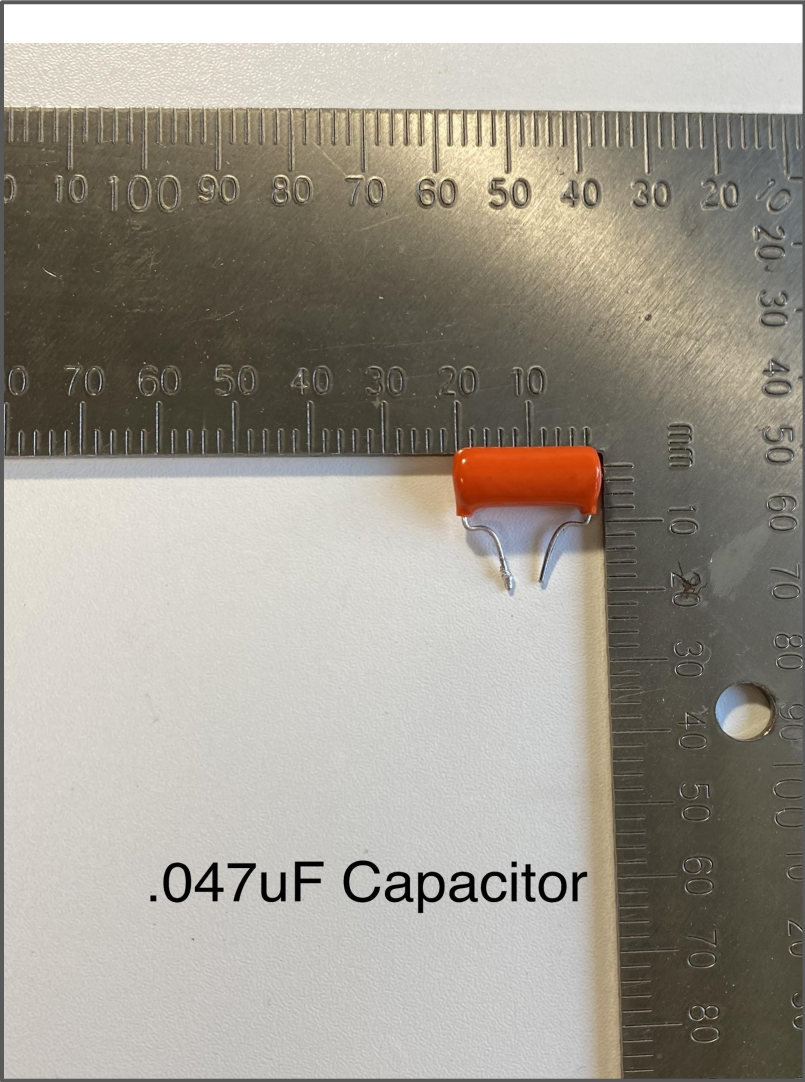
Volume Knob

Volume Knob

All electric guitars have a volume knob controller installed with a pickup selector switch. The volume adjusts how loud the output is.

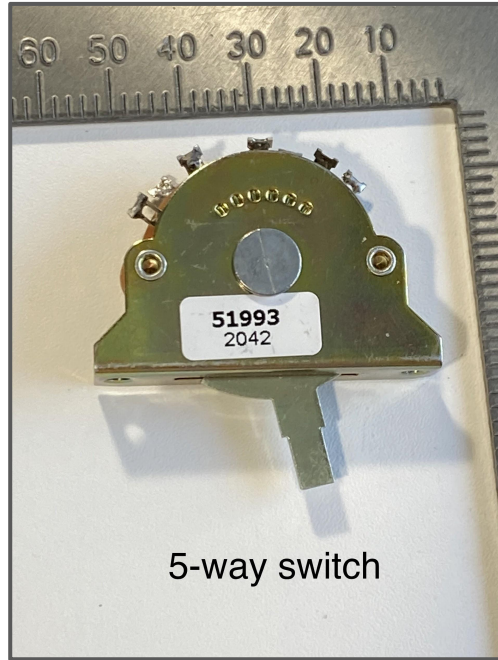
Capacitor

A capacitor is a simple electric component that filters certain frequencies. Higher frequencies pass through while lower frequencies are blocked.

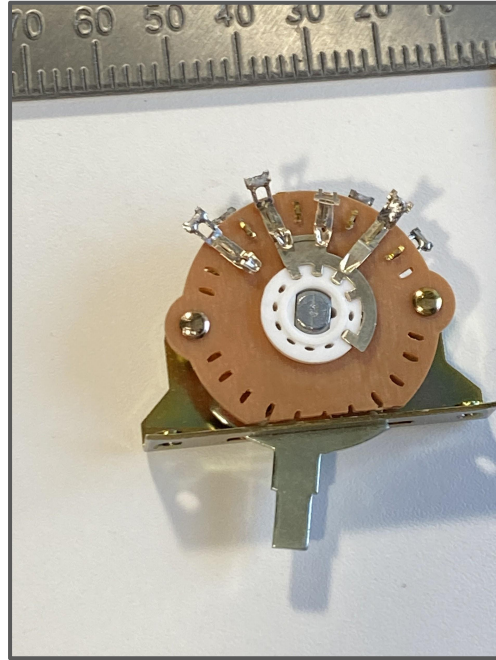


.047 μ F Capacitor

Five Way Switch



5-way switch



A five way switch is a pickup selector found only in certain guitars. It has five positions which means there are five combinations of pickups. It doesn't allow for all possible pickup combinations with 3 pickups guitars.

Conclusion

When we started working on this project we loved playing guitar but never knew about any of its components and how it worked. Now we know and can better appreciate playing this instrument. We all learned so much, not only about the electric guitar, but about ourselves and each other.

Credits

- <https://www.stringvibe.com/parts-of-an-electric-guitar/>
- <https://guitarclubhq.com/the-secret-to-great-guitar-tone-volume-and-tone-knobs/>
- <https://www.sweetwater.com/>
- <https://guitarskillsplanet.com/guitar-jack-types/>
- <https://www.yamaha.com/>
- <https://www.stewmac.com/video-and-ideas/online-resources/learn-about-guitar-pickups-and-electronics-and-wiring/understanding-guitar-wiring/>
- <https://www.stewmac.com/video-and-ideas/online-resources/learn-about-guitar-pickups-and-electronics-and-wiring/understanding-guitar-wiring-part-1-how-a-magnetic-pickup->
- <https://www.stewmac.com/video-and-ideas/online-resources/learn-about-guitar-pickups-and-electronics-and-wiring/understanding-guitar-wiring-part-4-what-is-a-capacitor-and-how-does-it-work/>
- Mike Pokrywka JAMM Handmade Guitars Pacific Palisades, CA