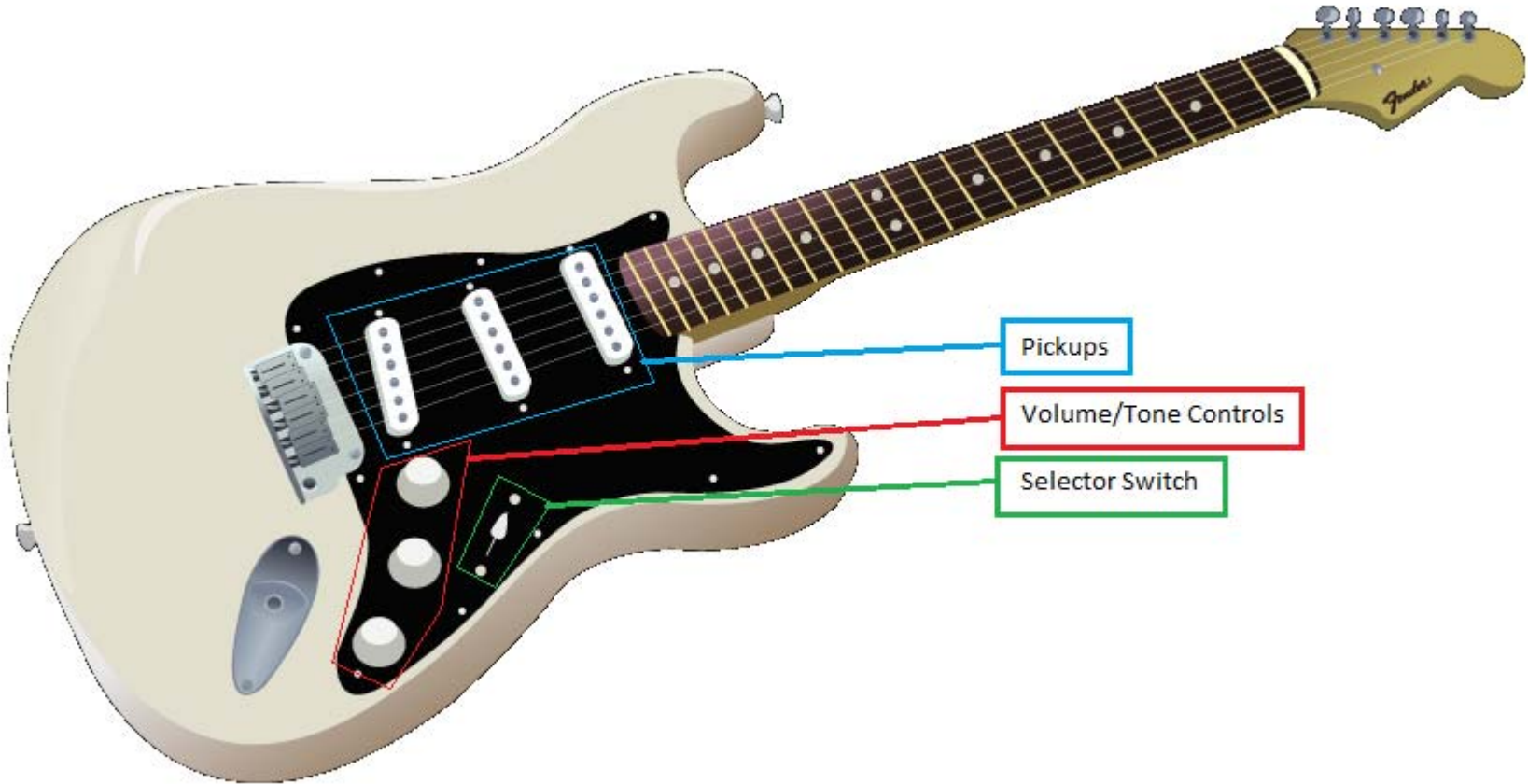


# How Electric Guitars Work



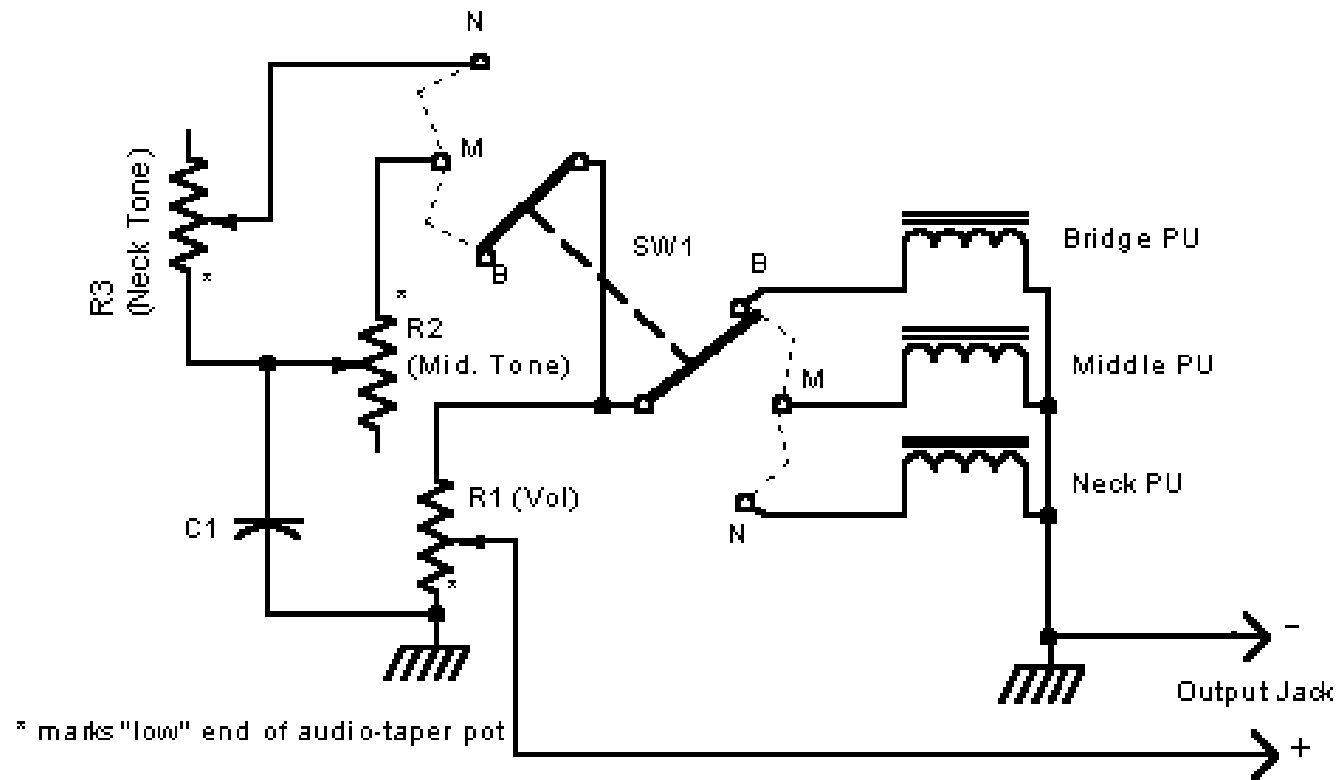


Pickups

Volume/Tone Controls

Selector Switch

# The Circuit:



# Pickups: Faraday's Law

- A time-changing magnetic field going through a circuit will create an induced voltage in that circuit
- A vibrating guitar string creates a changing magnetic field
- Guitar pickups (inductors) convert this magnetic field into a voltage through induction

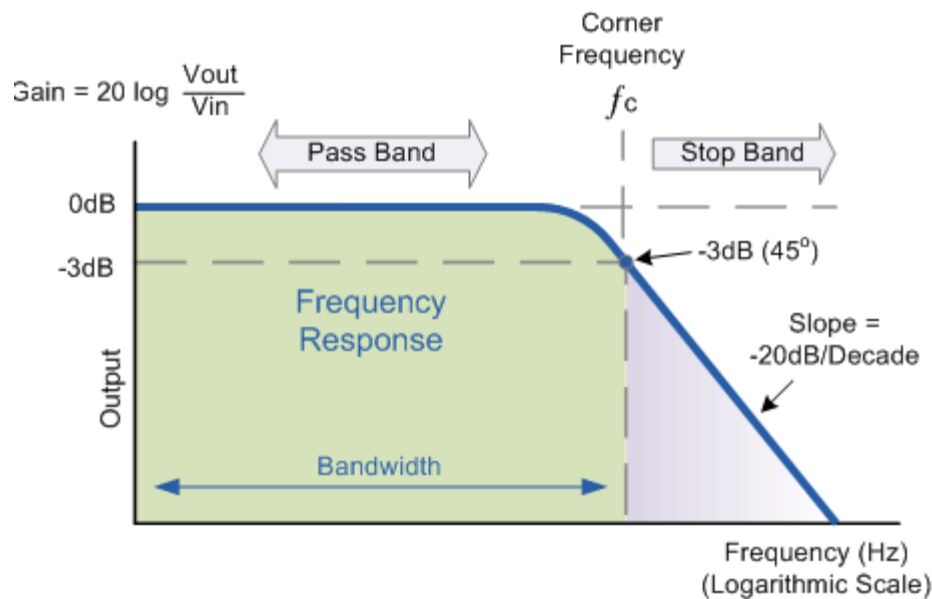


# Volume Control and Selector

- Volume control is a potentiometer that sends the signal from the pickups to ground or to the amplifier
- Selector switch simply chooses which pickup signal gets sent to the output, as well as which tone circuit is used

# Tone Circuit

- One side of a potentiometer = variable resistor
- This and the attached capacitor make an RC low pass circuit
- Low pass circuits let frequencies before a specified cutoff frequency through



$$f_c = \frac{1}{2\pi RC}$$