

Robotics Reverse Engineering Challenge

Lighting McQueen Speak and Spell

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- What I did
 - I used a powered screwdriver and my fingers to open up the Speak and Spell. After I opened each layer, I took pictures of what I found. I then used Bing to search for pictures of electronic components and matched them with the pictures I took. Then I summarized what each component did.
- What kind of device did you choose to explore, any why?
 - I chose to take apart an old Speak and Spell because it seemed like it would have a lot of components and I knew that my mom would be OK with me breaking it.
- What did you learn from exploring your electronic device?
 - I learned about capacitors and that they store energy. I learned that the device had several layers to it. Each layer has a different job. The top layer holds the display and on/off button. The middle layer has the speaker and the rail that holds the keyboard in place. The bottom layer holds the battery compartment and a few different circuit boards. I learned that it used metal rails and springs to open and close the keyboard. Overall, I learned that there are a lot of components inside an electronic device and they can be complex and that they each have a specific job.

Parts list (what I found during deconstruction and what role they played):

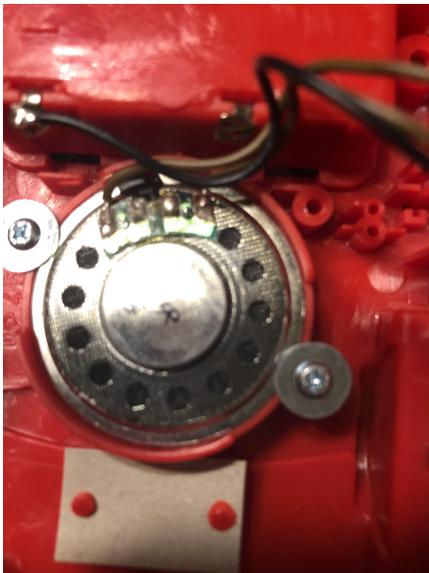
- Capacitors
 - Hold energy to help power the device
- Speaker
 - Produces sound from energy coming through the wires
- On/off buttons
 - Let energy flow and stop the flow, so that the device knows what to do
- Spring
 - Expands the device so the keyboard goes outward
- Keyboard
 - Signals to the device what to do
- Circuit boards
 - Carry signals to different parts of the device
- Rails
 - Create a smooth surface for the keyboard to slide on
- Battery compartment
 - Holds the batteries to power the device and sends the energy through wires
- Display
 - Shows the user what is going on
- Wires
 - Carry the energy to different components
- Ribbon cables
 - Send a lot of signals to other components all at once



This was what it looked like at the start



This is what it looked like split in half



This is the speaker that made the various sounds



This shows the metal rail right next to a circuit board



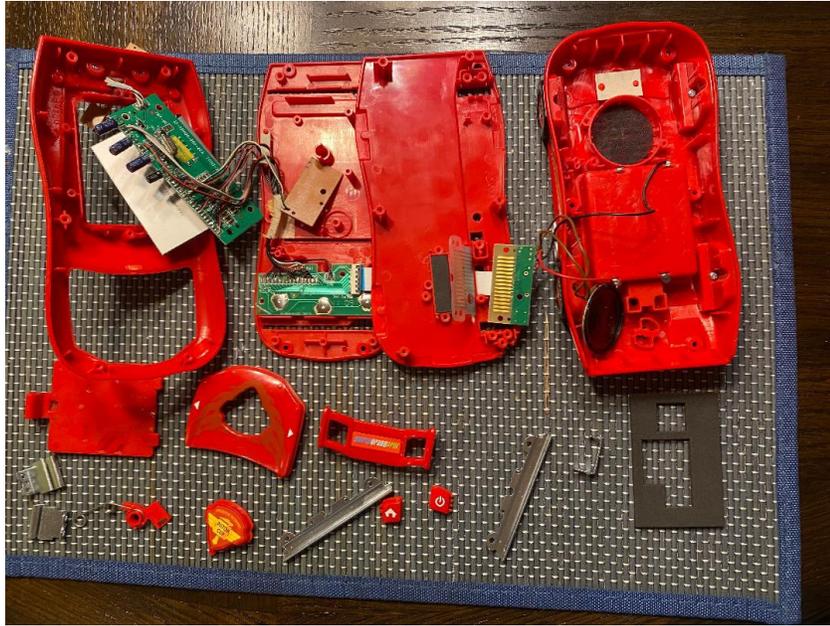
This shows the spring and pieces of the rail



This shows a circuit board with capacitors



This was the circuit board with the on and off buttons



This is all of the components spread out