Reverse Engineering Challenge

Ten Ton Robotics, West Vancouver Schools, British Columbia, Canada

Team 10012D

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Credits

Jim Jessup (father)– Explained a small part of the motherboard and wifi/Bluetooth antennas

Introduction

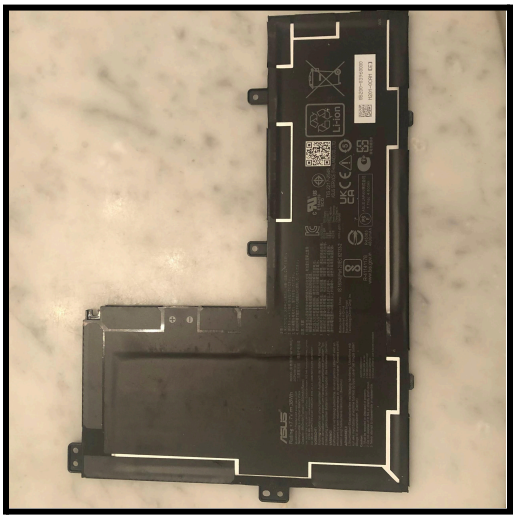
To participate in this reverse engineering challenge I deconstructed an Asus Chromebook computer. I chose to deconstruct a computer because it is a device used in my daily life and it is a device that is challenging enough to deconstruct but not impossible to do so as my first ever device I deconstruct. I also chose this device because I thought it would be great to challenge myself by deconstructing a device that has many components I don't know much about.

Parts List

1. Battery
2. Motherboard
3. Heat Sink
4. Wifi/Bluetooth Antennas
5. Speakers
6. Touchpad
7. USB–C/USB–A Controller

Findings

After carefully deconstructing the computer I discovered the following components and their roles:

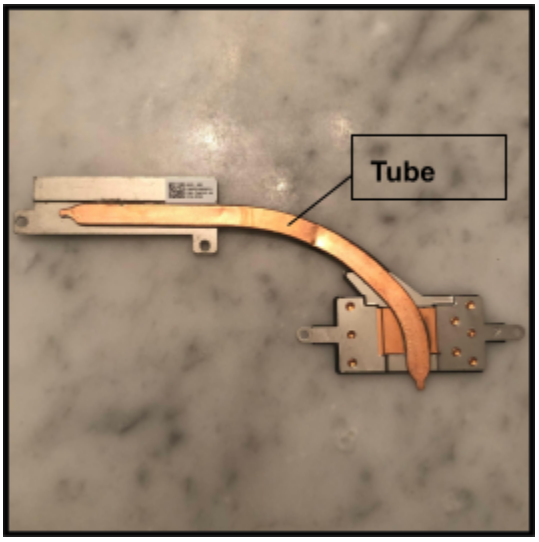


Component: Battery

Role: Provides power to the computer without the computer needing to be plugged in all the time. Plugging in your computer provides power for your computer while charging the battery

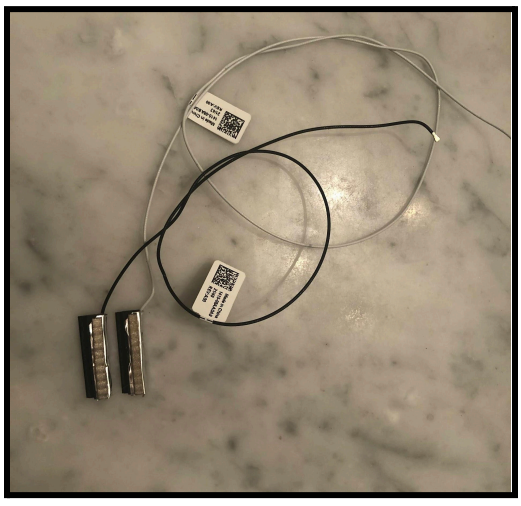
Component: MotherBoard

Role: Circuit board that connects all of the components in the computer allowing them to interact with each other. The CPU (central processing unit)(circled in red), is “the brain” of the computer. The CPU makes calculations for conducting tasks.1) In this computer the RAM (Random access memory) is built into the motherboard. RAM helps the CPU keep track of calculations and is also known as the computer’s short-term memory. RAM also helps swap data between the CPU and the SSD storage. SSD storage (Solid state drive) is the permanent storage of the computer.



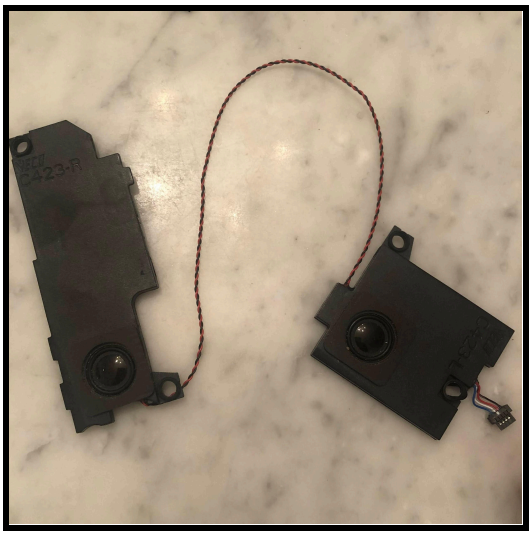
Component: Heat sink

Role: To bring heat away from the CPU (Central processing unit) by distributing the heat onto a larger surface area through pins which allows the heat to disappear. In this case, the heat travels through a copper tube and releases condensed heat near the other end of the tube.2)



Component: WiFi/Bluetooth antennas

Role: Provides connection for Bluetooth/Wifi card located on the motherboard. The antennas use different types of frequencies to obtain the connections. 3)

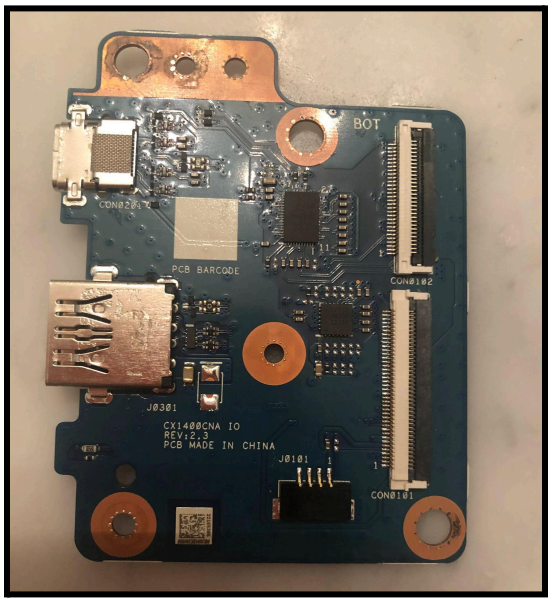


Component: Speakers

Role: Generates sound by converting electrical signals (electric current that carries information) into sound waves. 4) The sound waves are increased to make the sound louder.

Component: TouchPad

Role: Uses sensors to sense finger movements on the touchpad controlling the cursor on the display screen. Tapping the touchpad sensors registers as a click that interacts with the display screen. 5)



Component: USB-A / USB-C Controller

Role: Controls the Input and output of USB-A and USB-C devices

Conclusion

In summary, I took apart a Chromebook computer and discovered several components along with their roles. Taking this computer apart has taught me how to safely take apart a computer, which can help in the future deconstruction of electronics. I also learned a general understanding of how a computer functions along with some specific terms like RAM and CPU which I heard about before but needed help understanding their roles.

Bibliography

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