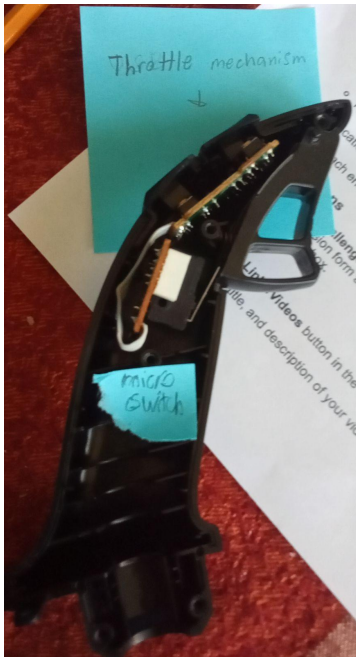
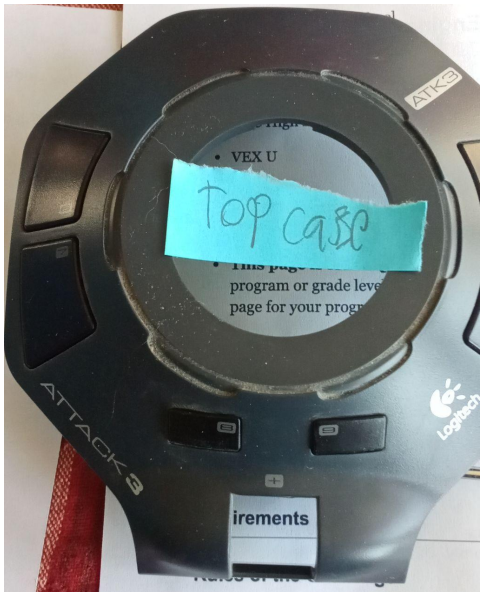
Reverse Engineering-Logitech Attack 3 Joystick

Landon Rice & Hazel Gibbs
Marshmallow Menagerie 60004Z
Arlington Heights, Illinois

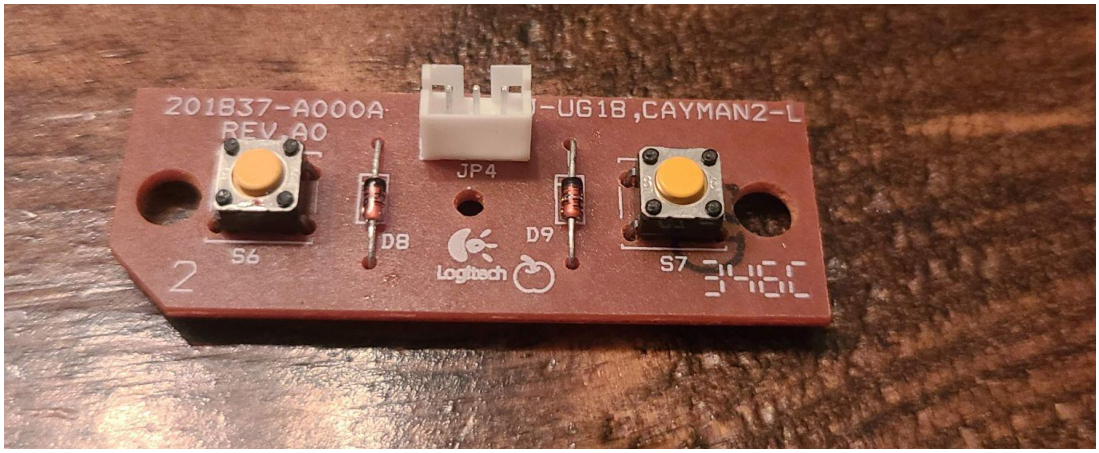
We chose to reverse engineer the Logitech Attack 3 Flight Simulator joystick because our team decided that it would be fun to take apart. We thought it would be fun to do this because it was an old gaming joystick, and we could learn how a joystick works. It was not too easy because It had multiple parts. It was not too hard, because it wasn't a really hard device like an ipad or computer, and we could identify all the parts. We also chose it because we thought we might be able to put it back together again (and we could).



This is the throttle mechanism. It has a micro switch inside of it, which detects when the main trigger is pulled. A micro switch is a small lever that senses when it is pressed.

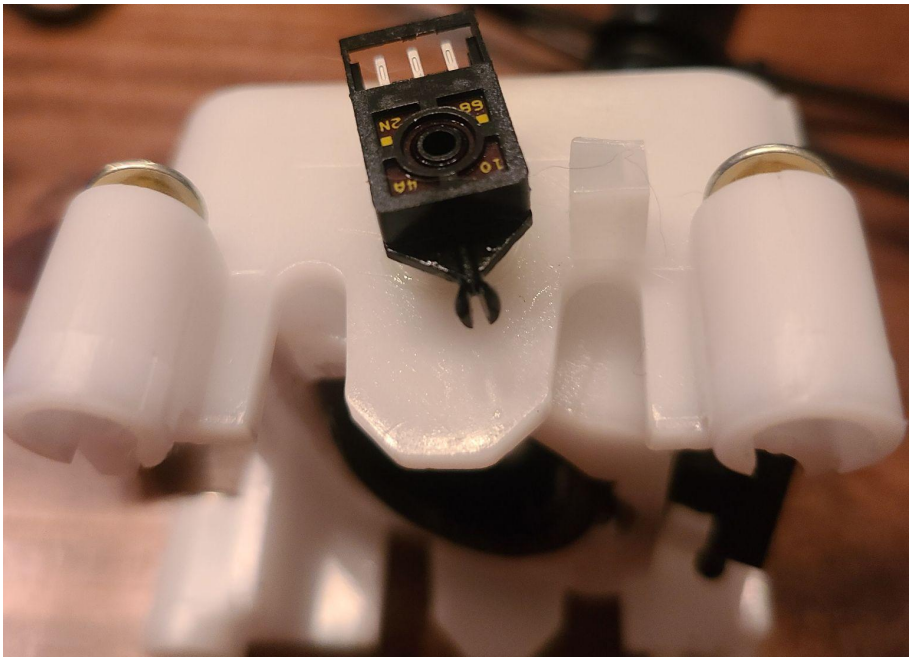


The top case covers up the bottom of the joystick, and has buttons 6-11. The buttons press a sensor on a computer chip.



This is the computer chip that sends the signal from the button to the motherboard.

The ST72F635K2M motherboard chip is a computer chip that collects all of the information the inputs provide, and turns it into USB output to control the video game.



The X-Y sensors calculate the position of the stick and send the information to the motherboard.

When we took apart the Logitech Attack 3 gaming joystick, we found some touch sensors in the throttle mechanism, and we recognised the micro switch. We also recognised the motherboard,

but we didn't know what type it was. In researching the two circuit boards, CAYMAN1 and CAYMAN2, we were unable to determine the manufacturer for them.

We learned that:

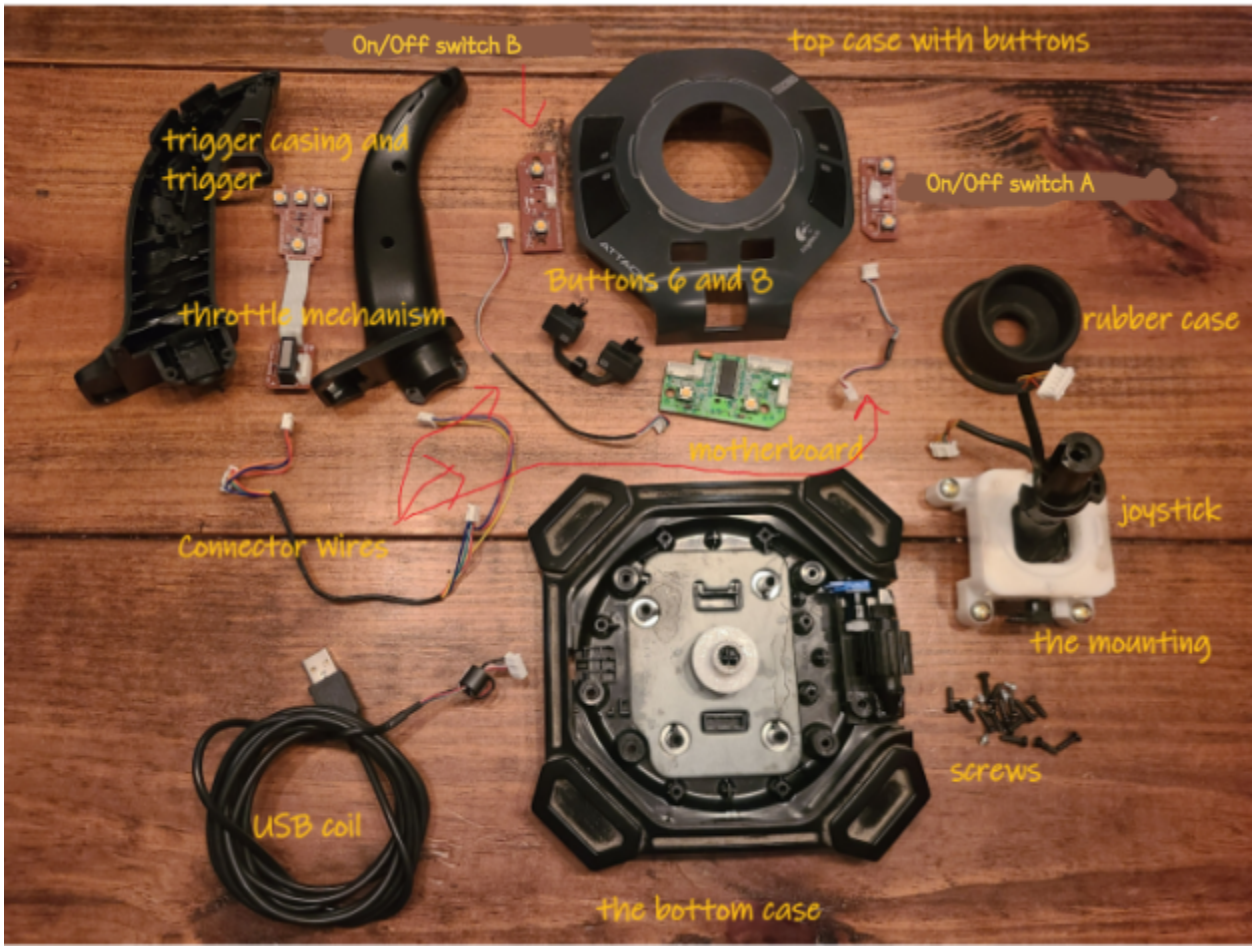
1. There were less than expected parts needed to control the game.
2. The names of the components.
3. The parts were bigger than expected.
4. Some of the parts we couldn't find in the website.

Here is the order we took it apart in:

1. We unscrewed most of the screws in the joystick so we could take it apart.
2. We took the joystick off of the base so we could examine it closer.
3. We started to take the individual parts out so we could research them.
4. We took photos of the parts so we could identify them.
5. We looked for a website so we could identify them.
    a. During this whole thing we were filming in case we wanted to put it back together.
        i. BUT there was no sound and the film isn't the best.
    b. The process took about 2 hours.
6. We identified some of the parts.
    a. Sadly, the website did not include all of the parts, so they're not all listed.
7. We started to label the parts and take photos of them
8. We lined the parts up in order to figure out which ones we didn't know about and were able to make a few guesses.

How it works:

The throttle mechanism uses touch sensors to signal when the buttons are pushed. The joystick itself uses X-Y sensors to coordinate its position relative to the base. There are 3 circuit boards inside. They take input from touch sensors, and turn it into USB output (used to plug into a computer) to control the game. The trigger activates the micro switch, which sends a signal to the motherboard, which turns it into a USB output so that it can control the game. The grease makes it so that there is resistance in the joystick and throttle. That way they don't move too quickly and make it feel like it's in a real jet.



Parts list:

1. Top case
2. X-Y sensors
3. ST72F635K2M motherboard
4. Micro switch
5. Throttle mechanism
6. Screws
7. Touch sensors
8. Buttons
9. Trigger
10. Outer casing
11. Circuit boards
12. Rubber pads
13. Grease*
14. Throttle
15. Wires
16. Bottom case
17. Trigger casing
18. On/Off switches A and B

19. Mounting
20. USB coil

*We don’t know what it is but there was a thick, grease-like substance coating some of the parts in the joystick. We think this was to make the stick and throttle have more resistance. That way, the stick would feel tighter and the throttle would stay where you put it.

Here are the sources we used to research, identify, and discover the pieces, some words, and a whole lot more:
https://www.petervis.com/modern-gadgets/Logitech_Attack_3/Logitech_Attack_3_Configuration.html
https://www.amazon.com/9632910403-Logitech-WingMan-ATTACK-Joystick/dp/B0000ALFC5
https://www.dictionary.com/