



# Electronics Online Challenge

11476C --- LionTech Robotics --- 2021

## 1. Introduction

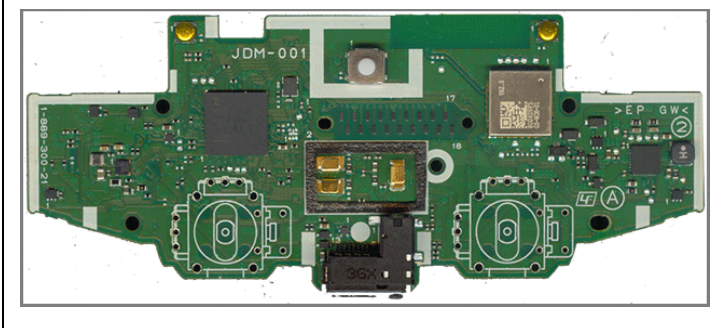
Desperately wanting to go back to school and begin practicing for the new game *Change Up*, the team continues our discussions with each other the way we usually do: while playing video games. One day however, while playing one of our team members controllers disconnected from the console for a brief moment and it sparked a memory we had in competition where our controller randomly disconnected midway into our match and caused us to lose. This led to Inquiries amongst our members and we thought we should get to the bottom of this dilemma. As a result, the device we chose to base this report on is a dualshock, wireless

playstation 4 controller. Our coach agreed this was a very good thing we should look into so we took this opportunity to take it apart and learn more about the controller to hopefully learn about our v5 controllers, especially when they're so essential to our Vex competitions.

## 2. Breakdown & Analysis of Components



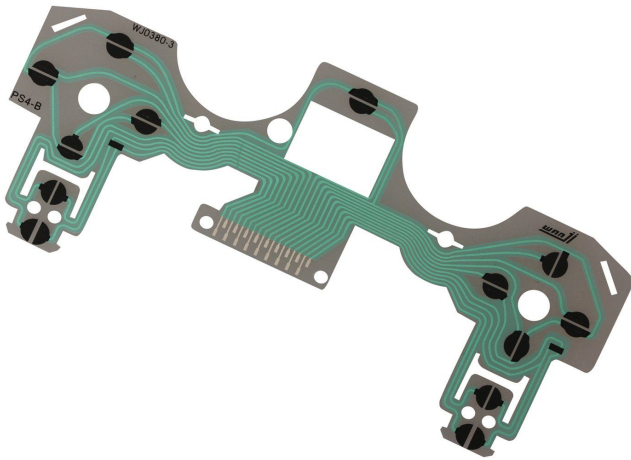
The battery: The battery used to power this controller is similar to that of a vex remote controller, the batter is called a 1000 mAh internal battery.






The controller PCB: The controller PCB or also called the JDM-020 is the current controller PCB, and it is the first to implement blind vertical interconnect access points, or links between the layers of a multi-layer PCB, for the daughter boards, buttons and connectors.



The vibration motors: The vibration motors are connected to the controller PCB so that there can be movement in the joystick.



The button PCB: The buttons PCB, Like on a computer keyboard, the PS4 button switches are not on the PCB but are on the buttons themselves. These switches are just conductive pads that strike the PCB when pressed, completing a monitoring circuit.

	<p>The battery holder: Upon opening the shell, the battery compartment is the first thing that pops up. There is nothing special about it though. It is just a standard plastic battery holder designed to fit in the case. It connects to the main circuit board texture through a plug.</p>
	<p>The light bar: built-in light bar that offers an additional point of interactivity in some games. Encased in a glass covering, the bar attaches to the controller through a clip, which in turn connects to the PCBs through a cable.</p>
	<p>The mounting plate: The PS4 controller PCB does not attach directly to the shell. Instead, it attaches to a mounting plate for stability. It is this plate that directly connects to the shell to hold everything in place. Along with the control sticks, directional pad, trigger, and buttons, you can control PlayStation 4 games with a touchpad. The touchpad assembly is on top, in the middle of the daughter circuit board texture.</p>

### 3. Conclusion

All in all, our team learned just how similar the components in our video game controllers are to the ones we use in competition! Whether that be from the same button layouts, to the battery system. We realized

our problem we would have was likely not a hardware, but a software dilemma. We also debunked one idea that our disconnections were likely from external sources, as we learned that components involved with the wireless transmissions and receivers have protectors from signals outside the specific range of frequencies that the controllers use in the bluetooth connection ( for the vex controllers the controller to brain, for the PS4 controllers it's the controller to console). This challenge was fun to do and taught us not only all we could've hoped to learn about controllers and more, but the value of research and the internet when inquiring about information for just about anything!

## 4. Pictures

