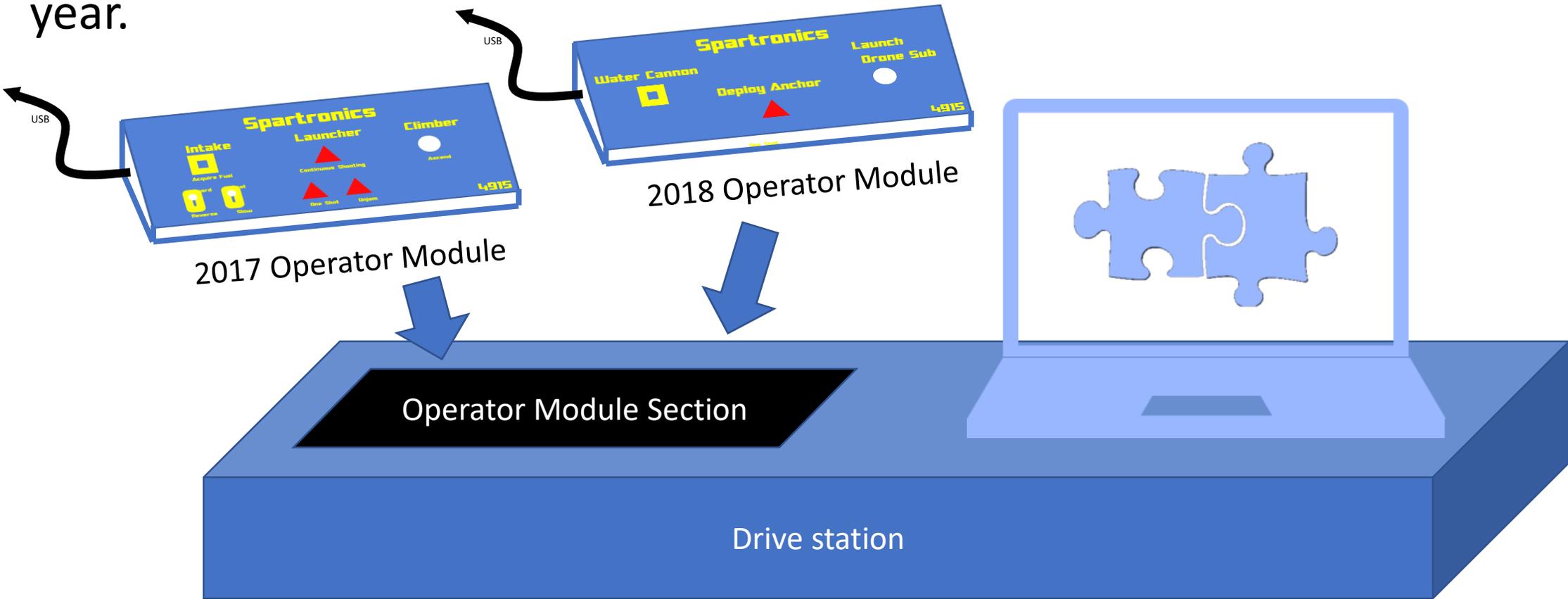


Extending a previous idea: Design a whole new drive station, and make a section of it able to support a new custom operator module each year. Could build the new drive station before kickoff and then just build the operator module during build season. After that, just need to design/build a new operator module each year.



# Original Idea - Possible Electronics Project: Custom Operator Controls

## CURRENT FLIGHT STICK HELIOS OPERATIONS CONTROLS

- Lower left: on and off (intake I assume?)
- Lower center - left: reverse (not sure - also intake?)
- Lower center - right: slow (intake?)
- Lower right: climb and off (understood)
- Stick - left: one shot (understood)
- Stick - center: launch (understood - both hopper & shooter, right?)
- Stick - right: unjam (understood - hopper)
- Stick - lower center: stop (understood - hopper/shooter)



USB



# Slack Dialog from Late October 2017

Slack discussion including Peter, Rose, Bo, Kenneth, Dana, Declan, Coach, and Jon  
From late October 2017

**Chris Rininger [12:06 AM]**

uploaded and commented on this file

Updated Drive Station Ideas.pdf →SEE PAGES 1 and 2 of this PDF

The leadership team channel is so full of activity (which is great to see!) that I thought I would pull out this group. A couple of you heard me talk about this idea at the leadership team meeting I think.

With the efforts being made this year with drive team, I think a good multidisciplinary project to do prior to kickoff would be a new drive station. A student or two could sketch some awesome concepts that incorporate our team's brand, and the small group working on the project would pick one of them. Then a CAD person could turn the concept into a more robust design, including selecting materials, getting precise with layout & dimensions, etc. And then the materials could be identified & ordered. Once the materials arrive, the new station could be built (maybe powder coating somewhere in there if metal).

I think this would be best as a completely student design, but there is one thing I would like to request: Design it in a way that a new operator module could be created and integrated with it each year, and that way the team would have an amazing looking, highly functional drive stations year after year. Attached is a very crude rendering of what I mean.

It would not have to be the captains who do this - it could even be a "sophomore project", into which sophomores are pulled from each discipline to work on it, and then the experience would help them come build season. A mentor or two would be needed to help... Dana, I included you because from past conversations I sense you may have some experience that would help.

Anyway, that's the idea. What do you think?

**Peter Hall [8:18 AM]**

I would love to help. Chris talked to me over the summer and even showed me an elementary design. I think this is a great idea and I would be happy to take it on as a preseason project. But it would be hard to make any operator decisions without the game and I'm not sure if this is something we want to take time for during build season.

**Chris Rininger [8:25 AM]**

Thanks Peter. Just to be clear: the proposal is to design & build the drive station without the operator module in the preseason, and then the only thing to design/build during build is the operator module.

# Slack Dialog from Late October 2017 (continued)

## **Dana Batali [8:57 AM]**

there are several things to think about independent of actual controls: one could put together a generic microcontroller "platform" that could handle arbitrary buttons once the game is revealed. Lots to learn here:

1. code to sample buttons, joysticks, etc
2. communication machinery to driver station and then to the robot.

If there is serious interest in this topic i would suggest we create a channel dedicated to this (rather than this private group-thread). Also, I'm certain that @riyadh and possibly @randy\_groves would be able to assist. As an aside, I've built my own custom mechanical keyboards and would be happy to show-n-tell if there's interest.

## **Chris Rininger [10:11 AM]**

Re: 1 and 2 above, from what I've seen there are kits with buttons and a USB-connected board, and in Windows it shows up as a standard game controller. Here's an example:  
[https://www.amazon.com/gp/product/B01M2X88QP/ref=ox\\_sc\\_sfl\\_title\\_2?ie=UTF8&psc=1&smid=A3H7VB6FZ4M9FM](https://www.amazon.com/gp/product/B01M2X88QP/ref=ox_sc_sfl_title_2?ie=UTF8&psc=1&smid=A3H7VB6FZ4M9FM)

so implementation wise I think it would be just like using the flight stick buttons

Even if it is decided the custom operator controls are too much to bite off this year, I think the design/build of the drive station itself would be a good project. Joystick buttons could still be used for operator controls in that case. I look at our current drive station with the painted PVC, and it seems a bit long in the tooth, though it is certainly functional. If there's no interest, that's fine as well. We could consider it as a potential summer project, using the BARN's facilities? Maybe one of several summer projects at the BARN? I'm not looking to lead it - I just wanted to put it out there as a doable off- or pre-season project. (edited)

## **Declan Freeman-Gleason [10:51 AM]**

Do we still want a channel for this? If we plan to do it in the interim, then we should make one (as we don't know who will get involved in the future.) (edited)

## **Peter Hall [10:51 AM]**

I'm totally interested even in the custom operator control which would be built during build season. And I agree the we could build a better driver station in general during preseason I think that it would be a great preseason project so if we can get some on the mechanics to build a cool frame I would be happy to put some of my people on the guts.

That's a good point Declan

# Slack Dialog from Late October 2017 (continued)

**Declan Freeman-Gleason [10:53 AM]**

I think it would be a good programming project, it doesn't seem terribly complex, so we should have the capacity.

@kenneth\_wiersema @rose\_bandrowski What is mechanical's opinion on this?

**Kenneth Wiersema [11:55 AM]**

I would want more details on what you're looking for, and I just see this as busy work to a point, as our current system seems to work fine. I think a drive team person should have more of a say on whether custom buttons would be advantage vs just using buttons provided on a controller.

To build it, we would need dimensions of it and what your replaceable mechanic controller port would be. I'd like more hard details.  
Or when someone comes up with that sketch for the design, then I'll see what you're wanting

**Chris Rininger [3:23 PM]**

Beyond functionality, it's worth considering that our drive station and also the robot cart are as or more visible than our pit at competitions, so from a marketing perspective having a professional looking drive station is advantageous. It could even have a bit of influence on getting picked for an alliance. Polycarbonate, metal, and wood are the primary options as far as materials. Here are pictures I took last year for inspiration: [https://1drv.ms/f/s!AikCDwtdoW5Lqj66386jgdCO\\_tXj](https://1drv.ms/f/s!AikCDwtdoW5Lqj66386jgdCO_tXj)

As I said, I'm putting it out there as a doable project that will add value - doesn't have to be this season - could be next summer or whenever.

**Rose Bandrowski [10:24 AM]**

I've been so busy with everything else, so I just got to see this discussion, but I love the idea and totally am on board! It could be a good project to teach newbies with for sure.

Also I agree with Chris, presenting ourselves as a professionally marketed team is important beyond function.

I personally would like to see some programmable bling on it like our robot's have.

**Chris Rininger [10:28 AM]**

Thanks Rose, I think there are a couple initial steps 1) Assemble a simple list of requirements and constraints (e.g. size limit in the rules) and in parallel 2) a person or two could create some concept sketches

# Slack Dialog from Late October 2017 (continued)

**Rose Bandrowski [10:30 AM]**

I agree. I haven't had time to look at the leadership notes but it sounds like we want to make "widges" or something and this easily could be one or something we could work on planning during this week's meeting.

**Declan Freeman-Gleason [10:30 AM]**

I think that some bling could be really fun.

**Rose Bandrowski [10:30 AM]**

I just saw that glass driver station in Chris's photos and it had some cool lighting so it made me think of that - we don't have to use glass though

In fact we probably shouldn't, polycarb would do the job.

**Chris Rininger [10:32 AM]**

Since I got us into this Direct Message thread which is limited to 8 people (probably a failed experiment - my goal was to avoid polluting the leadership channel with this whole conversation), I will copy this conversation into a file. If someone would create a Slack channel for this, I'll post the conversation so far there, and we can continue it there.

That way others can join in beyond the 8 we have on here

[extended conversation about how to create the channel truncated]