

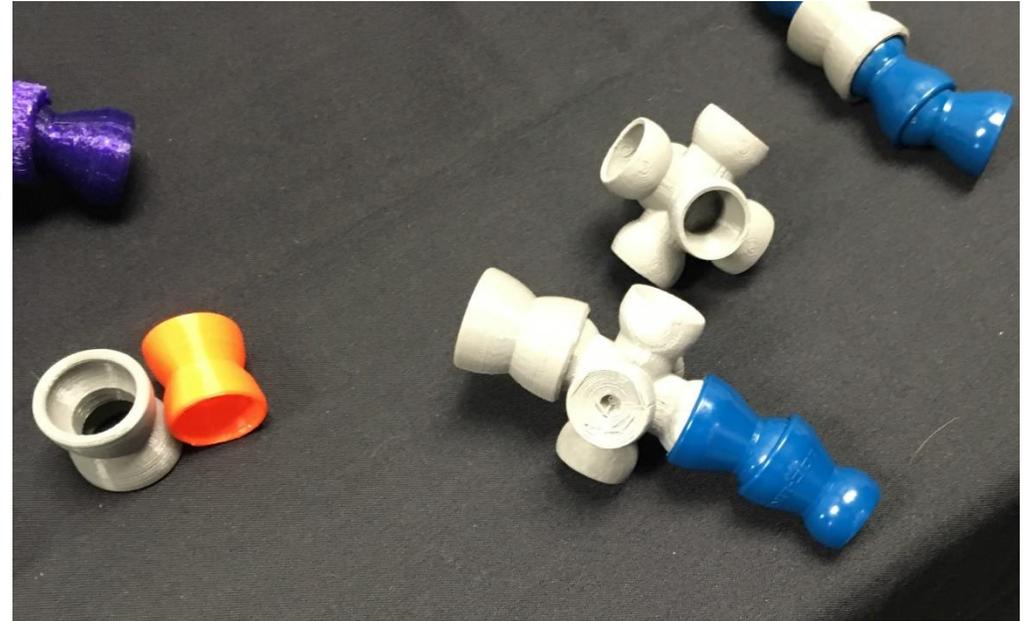
# Flex Bracket Adapters

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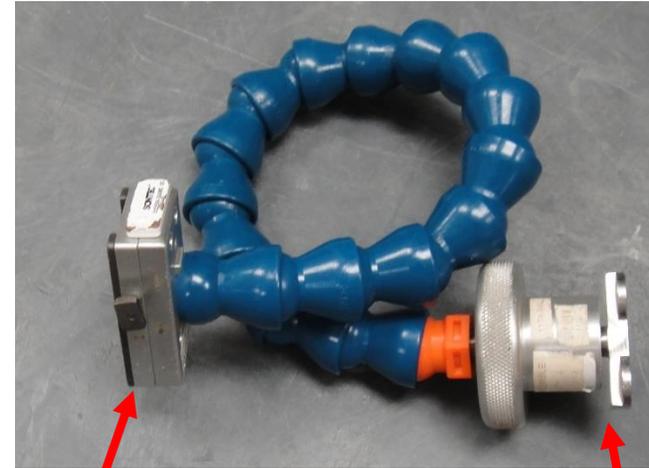
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The objective for this project was to come up with an adapter that would make the existing equipment on the ISS more versatile and expand it's usefulness.

- Flex Brackets are restraints that are used often on the ISS because of their flexibility and ability to be extended. All of the brackets have a seat track foot on one side and a camera shoe on the other.
- Flex brackets are composed of several small segments that are snapped tightly together to make longer “hoses”. These are commercially known as Loc-Line and can be found on the internet. On the ground these hoses are used for directing coolant and lubricant fluids onto materials during the cutting process. The company sells a few kinds of adapters but are directed at fluid transport not the mechanical uses we have on the Station.
- On orbit they are mostly used for holding cameras, lights, fans and maybe parts of experiments in a location. The tight fit of the segments have a good friction fit that allows them to hold a position they have been placed in.



Loc Line segments

NASA Camera Shoe

Seat track foot





Seat track foot attachment



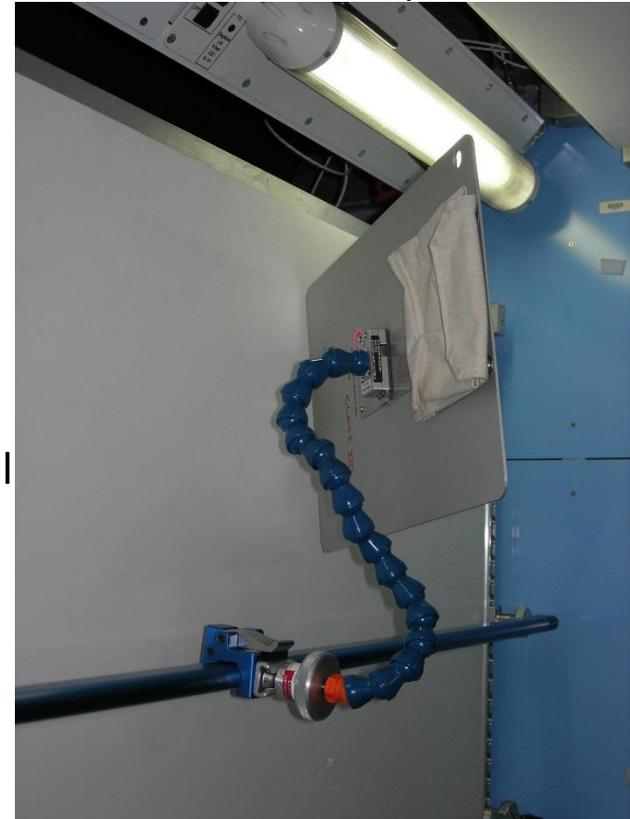
Flex bracket on an IP  
Clamp with Camera  
Shoe visible

- What kind of adapters could be made that allow the crew to attach multiple camera shoes or multiple seat track feet?
- Are there other things that could be printed out that would be valuable for holding tools, paper, personal items?

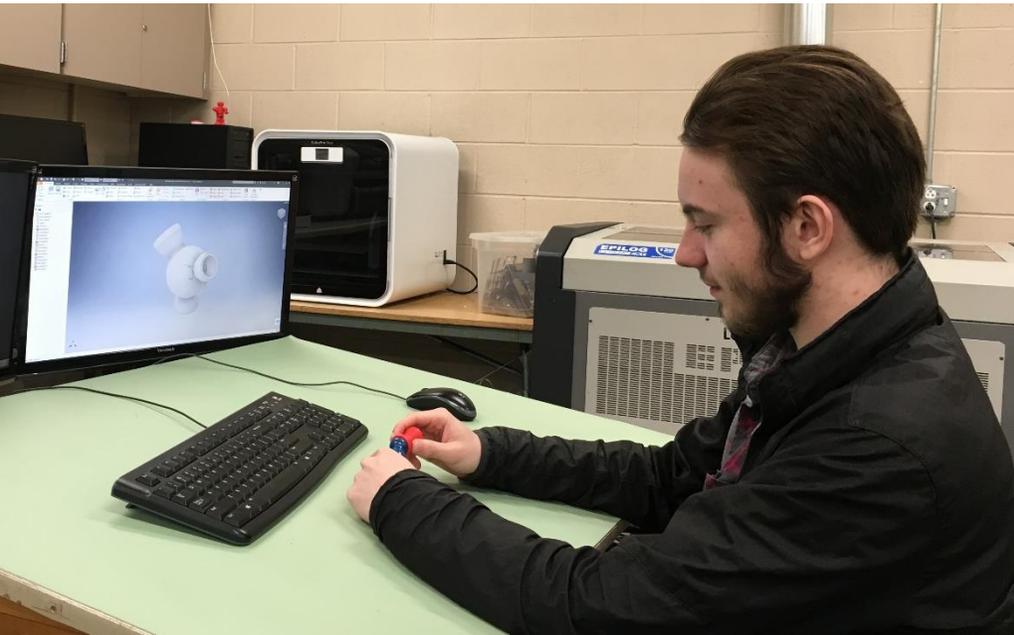
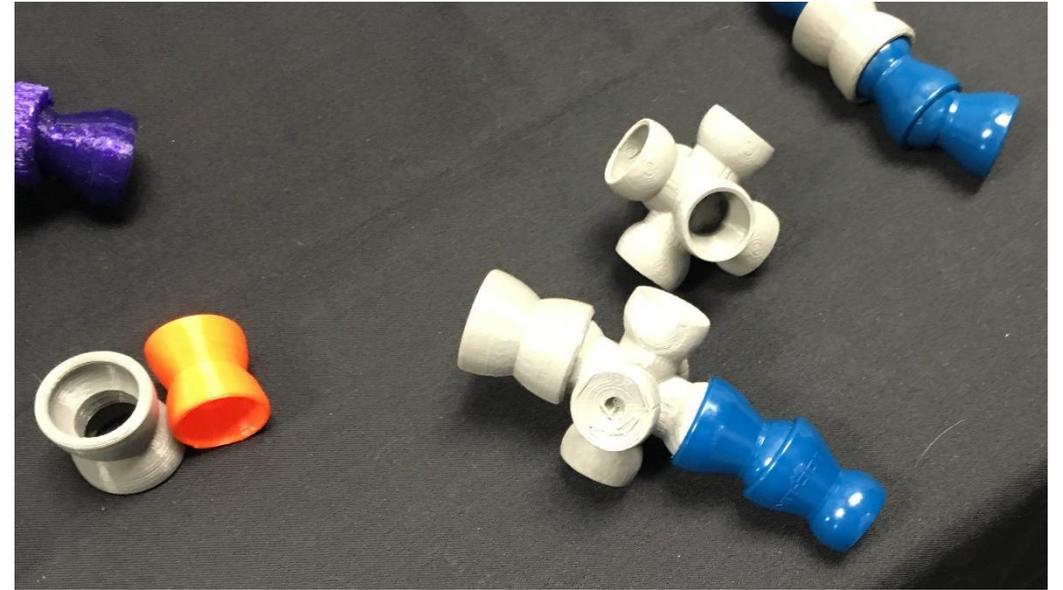
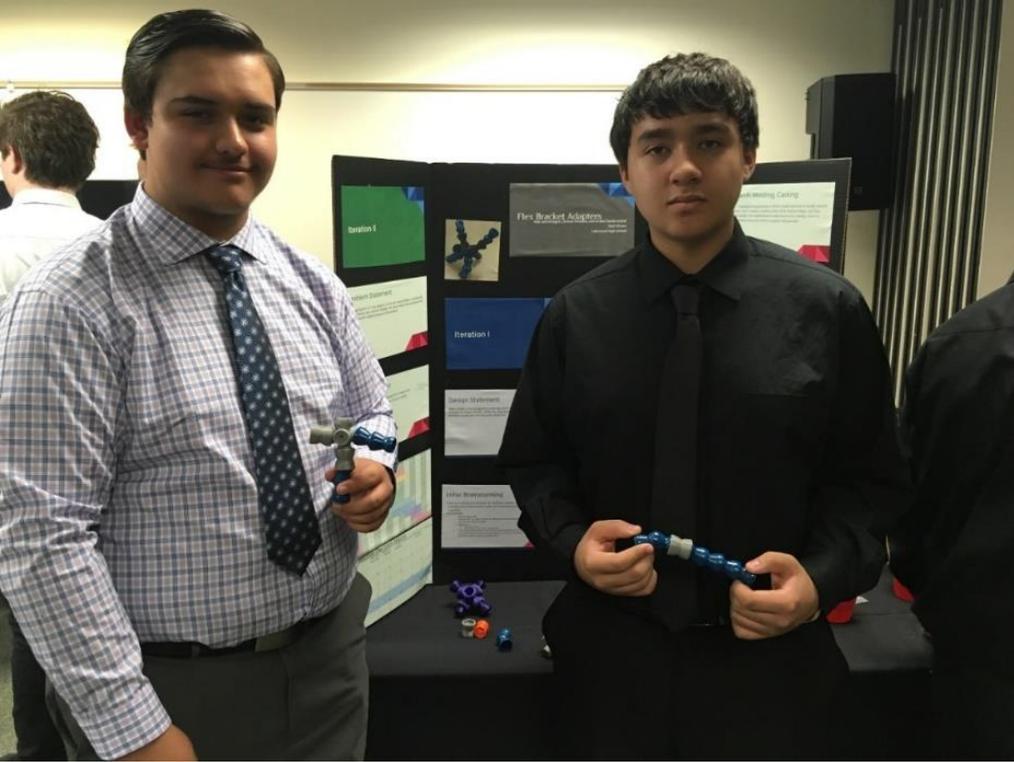


Make shift ball to ball and  
socket to socket dapters.

Flex Bracket on a Handrail  
Clamp holding a Laptop  
Desk



Students came up with some new options.





- Although Loc Line makes these two orange fittings, they don't make ones like this.



- I expect the reason they don't make a 6 ball is because it wouldn't transfer liquid very well. This one is solid because we don't need fluid flow, we want a mechanical connection.

# A few of the possible options



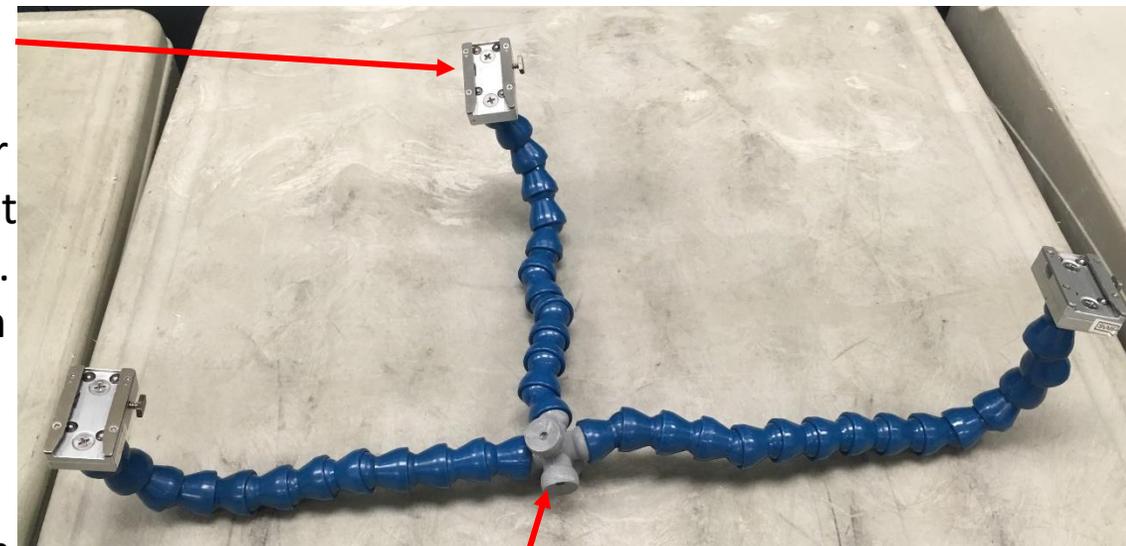
A Flex Bracket could be used like a handrail in the Cupola and span longer distances and connect in variable angles.

Work Lights are spread apart for less shadows behind a rack, between hatches, inside a panel...but still easy to position for the optimum lighting for repairs, experiments, video and still shots.



Six ball connector and 1 socket to socket connector

Camera shoes can hold cameras, lights, computers, fans, power strips, or many different experiment equipment. The same configuration with seat track feet could be used for holding bags or equipment in a location.



Six ball connector

# Another Potential Configuration

HD video camera on a standard Flex Bracket camera shoe

Flex Bracket Adapters-  
2 socket to socket adapters  
One 6 ball core



A method of organizing a video package to improve lighting while doing a video tour. Another arm could include an IP Clamp to hold a separate microphone for the person holding the camera or an iPad acting as a teleprompter.

2 Seat track feet from standard Flex Bracket for increased stability.

2 Work Lights on standard Flex Bracket camera shoes. Longer flex brackets could allow for varying light positions—less shadows.

# Conclusion

By using a combination of the socket to socket and ball to ball connectors, the Flex Brackets go from having a few uses to many uses.

- Handrails that can go more places
- Tie together multiple Work Lights to minimize shadows for work areas
- Connect cameras, Work Lights in new configurations for better video tours and more flexible platforms for stationary operations.
- Provide options for holding computers and experiments in different locations and configurations for expanded use of spaces.
- Configured for restraining bags or experiments in a semi-rigid structure—Flex Bracket Web.
- Students are currently working on “chip clips” that could attach to the adapters to hold papers, flash lights, zip lock bags with parts, pouches of wipes, iPads.....

