



# Adaptive Case for PS4 Controller

## DESIGN RATIONALE

### Introduction

The Adaptive Case for PS4 Controller is an inexpensive and non-destructive controller modification designed to make the stock PS4 controller more accessible. This device aims to assist those with limited hand dexterity by enlarging and spreading out the buttons on the PS4 controller. This device can be mounted to a surface so that both hands can freely operate the controls.

### Research

| Device                                                                                                           | Price     | Notes                                                                                                                                                                                                                              | Link                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XAC – Commercial<br>            | ~\$130 CA | The Xbox adaptive controller allows users with limited dexterity fully customize their gaming set up with different assistive switches and joysticks. This device costs around \$130 plus the additional cost of external devices. | <a href="#">Xbox Adaptive Controller   Xbox</a>                                                                                                                                 |
| One Handed Ps4 Controller<br> | DIY       | This DIY device is inexpensive and fully 3D printed. It targets users with one hand or users with more dexterity in one hand.                                                                                                      | <a href="#">One-handed DualShock 4 by Akaki   Download free STL model   Printables.com</a><br><br><a href="#">One-handed PS4 Controller Modification - Makers Making Change</a> |

### Requirements

#### Goals

|     |                                                                       |
|-----|-----------------------------------------------------------------------|
| G01 | Allow users with limited hand dexterity operate the PS4 controller    |
| G02 | Nondestructively modify the PS4 controller to make it more accessible |
| G03 | Assist users who find it challenging to hold a controller             |

#### Functional Requirements

|     |                                                                                 |
|-----|---------------------------------------------------------------------------------|
| F01 | Must fit the standard PS4 controller (DualShock 4)                              |
| F02 | Must allow users to operate the PS4 controller with limited dexterity and force |

#### Non-functional Requirement

|      |                       |
|------|-----------------------|
| NF01 | Must be easy to clean |
|------|-----------------------|

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### Constraints

|     |                                                 |
|-----|-------------------------------------------------|
| C01 | Must be printable on standard Maker 3D printers |
|-----|-------------------------------------------------|

### Version 1.0

The Adaptive Case for PS4 Controller is designed by [Cisco](#) on [Printables](#) under the [GNU GENERAL PUBLIC LICENSE](#).

This device encapsulates the controller in an adaptive case that can be mounted to a surface, so users do not need to hold the controller. It has multiple joystick options to help tailor the device to the user.

### Device Testing

#### Assembling

- Little difficult to feed in Button Tails
  - Broke R1 tail while feeding into its slot.
  - Using sandpaper to smooth rough parts on these tails helps.
  - Using a zip tie to clear the tunnels also helps.
  - May take a few extra tails to install properly.
  - Once installed, they work great.
- Joysticks
  - Very secure when properly attached.
  - Very difficult to thread screws into joystick toppers.
  - Broke two different mounting screw while attaching the joysticks to the controller.
  - Threads broke off inside the joystick toppers. All had to be reprinted.

**Notes:** The designer has been contacted and is willing to modify the print files so threads can be printed sideways to increase strength. The designer will also increase the thread tolerances to make the joysticks easier to attach.

### Design Improvements

After discussing some of the issues found with the designer, he was able to send some new models to try along with the original Fusion 360 files. The new models were tested but it was found too difficult to attach the joysticks to the controller.

With the Original Fusion 360 files, we were able to re-examine the joystick screws and use an alternate method for adding clearance. After adding 0.15mm clearance to all the threads in the design and changing the screw print orientation to lay flat on the print bed, they were successfully tested on multiple printers.



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### Opportunities for Improvement

- Allow Touch Pad to be pressed.
- As only L2 and R2 bumpers can be triggered, it would be nice to allow access to the L1 and R1 bumpers.