



DIY Projector for the Nintendo Switch

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<https://learn.adafruit.com/diy-projector-for-the-nintendo-switch>

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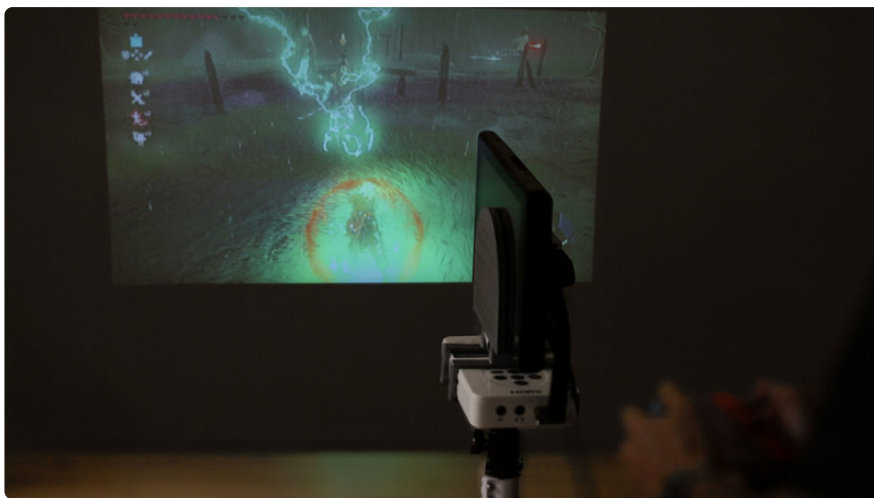
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Overview

3D Printed Dock Projector

In this project, we'll show you how to DIY your own Portable Projector for the Nintendo Switch!

We designed and 3D printed a custom dock that holds an off-the-shelf PICO projector. This of course allows you to project gameplay from the switch to just about any surface!



Proof of Concept

We like to think of this as more of a prototype and proof of concept. We hope this inspires the DIY community to take a stab at making their own Mods for the Nintendo switch.

We had a lot of fun during the tearing down and hope it serves as a future reference for anyone looking to do something similar.

Projector Gameplay

Although the Nintendo Switch is already portable, using a projector instead of a TV is a novel idea in those situations where it makes sense. Compared to the official dock

from Nintendo, our 3D printed version is much slimmer and exposes the electronics showcasing the DIY goodness.



AAXA LED Pico Projector

<https://www.amazon.com/gp/product/B005TAXDPK/> (<https://adafru.it/yXF>)

25 Lumens

960x540 Resolution (16:9 compatible)

80 Minute Built-in Battery

Built-in Speakers, mini-HDMI, Composite A/V connections,

Micro SD & USB reader support

Up to 60 inch image (in low-light condition)

Parts, Tools and Supplies

Here's a list of the parts needed to make this project.



HDMI Plug (<http://adafru.it/3548>)

HDMI Mini Plug (<http://adafru.it/3552>)

HDMI Ribbon Cable 20cm (<http://adafru.it/3561>)

Tri-wing: Y3 Screw bit (<http://adafru.it/822>)

Tripod bits (<https://adafru.it/yYd>)

M2x.4x5mm (<https://adafru.it/yYe>)

M2X.4x12mm (<https://adafru.it/yYe>)

PLA Filament (<https://adafru.it/yCs>)

3D Printer (<http://adafru.it/2412>)

Tweezers (<http://adafru.it/421>)

Diagonal Flush cutters (<http://adafru.it/152>)



DIY USB or HDMI Cable Parts - 20 cm Ribbon Cable

If you're looking to make a custom cable with any two of our USB or HDMI adapters, then you'll need to have these flex cables handy! Making custom cables has never been...

<https://www.adafruit.com/product/3561>



DIY HDMI Cable Parts - Straight Mini HDMI Plug Adapter

If you love DIY cable-rigging, then these HDMI adapters are right up your alley! Making custom HDMI cables has never been easier. Just grab one of our

<https://www.adafruit.com/product/3552>



DIY HDMI Cable Parts - Straight HDMI Plug Adapter

If you love DIY cable-rigging, then these HDMI adapters are right up your alley! Making custom HDMI cables has never been easier. Just grab one of our

<https://www.adafruit.com/product/3548>



Swivel-Head Pan Tilt (PTZ) Shoe Mount Adapter

This Swivel-Head Pan-Tilt (PTZ) Shoe Mount Adapter allows you to attach something with standard 1/4" machine screw mount to a camera's shoe...

<https://www.adafruit.com/product/2464>



38 Piece Screwdriver Set

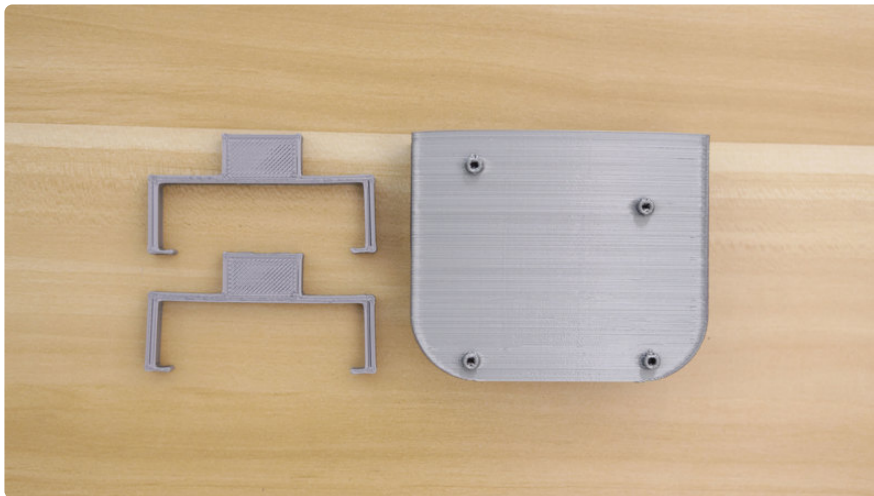
Look, over there at that thing! Take it apart! You can now attack just about every kind of box or enclosure that needs undoing with this 38-bit screwdriver set. This set is fine...

<https://www.adafruit.com/product/822>

3D Printing

The 3D printed parts are fairly easy to make with most common home desktop 3D printers that are on the market.

And if you don't have access a 3D printer, you can order our parts by visiting our Thingiverse page and have someone local 3D print the parts and ship them to you.



3D Files and Modifications

The parts were designed in Autodesk Fusion 360. If you're interested in modifying the parts, you can download the source file. If you're using different 3D modeling software, you can save it out as a STEP, IGS, OBJ and other file formats. The STLs can be downloaded "as is" from the repo sites listed below.

[Download Fusion360 source](#)

<https://adafru.it/yYf>

Download from Thingiverse

<https://adafru.it/yYA>

Download from Youmagine

<https://adafru.it/yYB>

Download from Pinshape

<https://adafru.it/19eT>

Slice Settings

Download the STL file and import it into your 3D printing slicing software. You'll need to adjust your settings accordingly if you're using material different than PLA.

- 230C Extruder Temp
- No heated bed (65C for heated)
- 90% Extrusion Multiplier
- .4mm Nozzle
- 0.48 Extrusion Width
- .3mm Layer Height
- 10% infill
- No Supports

Assemble

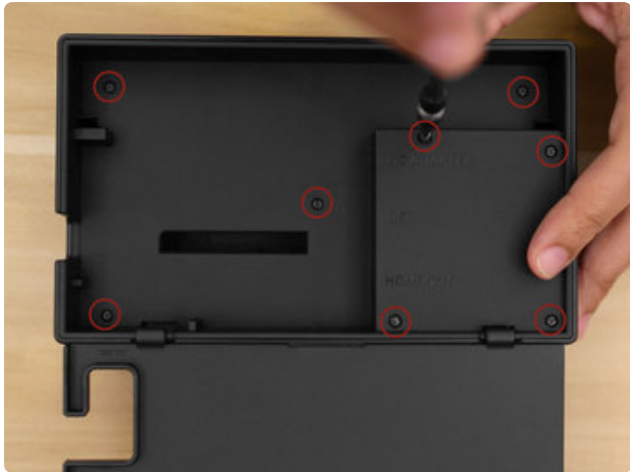


Nintendo Switch Dock Tear Down (<https://adafru.it/yYC>)

Now to make this work, we did repurposed the electronics from the official dock. So we'll need to do a proper tear down which is actually pretty fun and easy.



To get inside the dock, we'll need a special Tri-Wing screwdriver which was included our 38- piece screwdriver set.



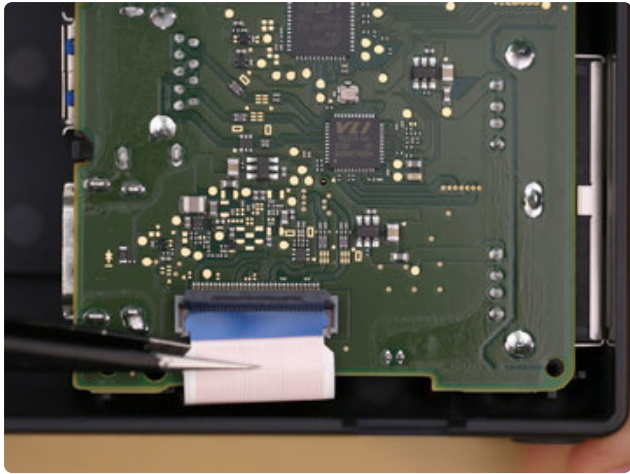
We'll need to remove a handful of screws found behind the latching panel.

Use the Y3 Triwing screwdriver bit found in the 38-piece screwdriver set.



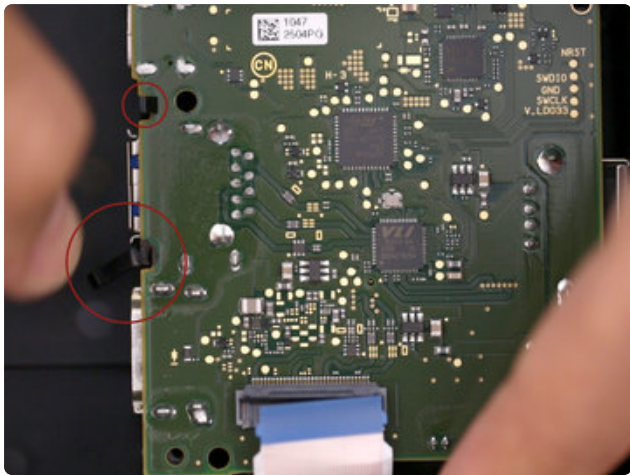
Remove the eight triwing screws and set them aside. You can store them for use in another project.

Once removed, you can easily lift half of the shell to reveal the main circuit board.



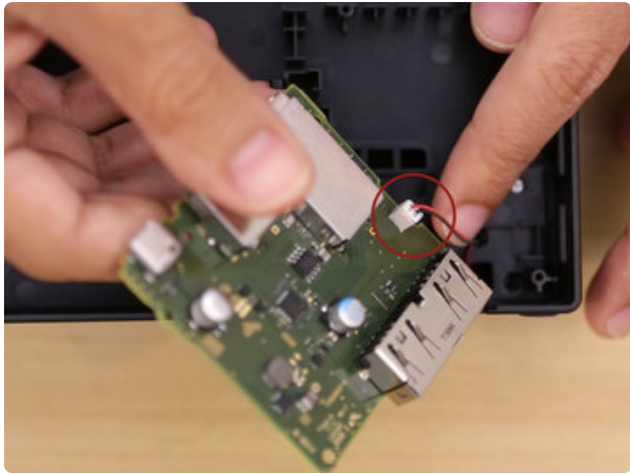
The board itself is held in place with these little clips –

Before we take it out, you'll want to disconnect the main ribbon cable by releasing the latch and carefully pulling it out.



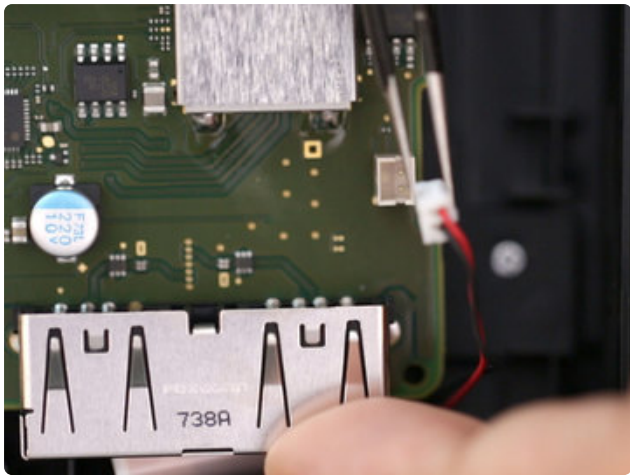
Use a tweezer to help wiggle the two tabs out of the slots on each side of the ribbon cable.

Then we can remove the board by freeing it from the clips.



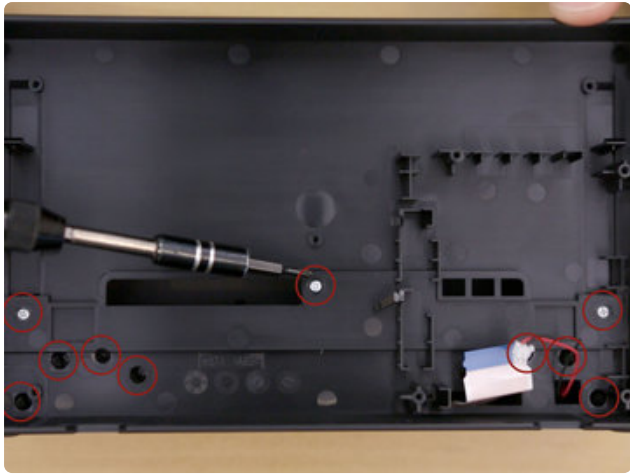
Be careful not to pull it all the way out because we'll need to disconnect this JST cable from the board.

Use flat pliers or tweezers to help loosen the JST connector. Careful not to grip the JST too tight as the plastic is fairly thin and can deform.



Wiggle the JST from side to side as you gently pull it out of the connector.

And with that, we've liberated the board from its dark injection molded prison.

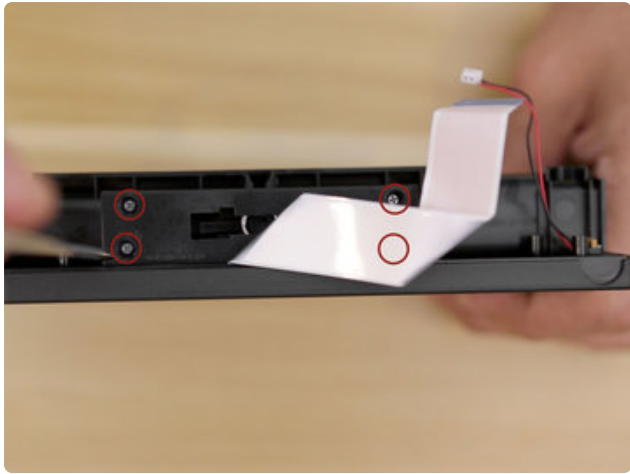


Next, we'll need to remove these additional screws to get to the USB-C Connector.

This guy is sandwiched in between the two halves of the enclosure. We'll need to switch from the Tri-Wing screwdriver to a phillips head.



Six of the screws will be in the countersink holes, so we'll need to use a thinner long screw driver that can reach these screws.

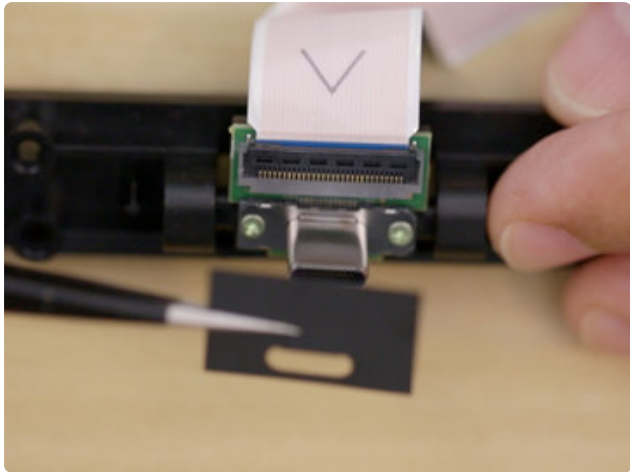


Now we can pull the two halves apart and flip the assembly to reveal the underside. Here are four more screws which secure the USB-C connector.



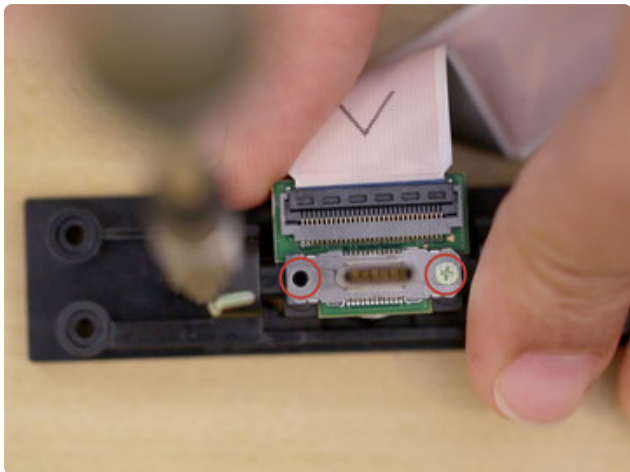
Once removed, we can see two springs and a mounting plate housing the USB-C connector.

You can set the springs and screws a side for another project.



We'll need to remove this cover which reveals even more screws.

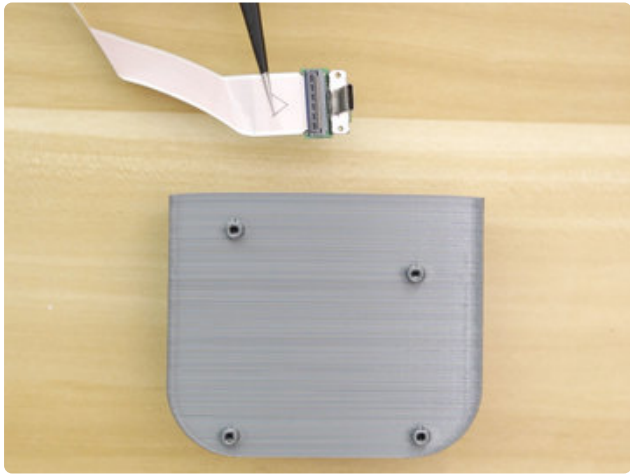
These two remaining screws secure the USB-C assembly to the mounting plate.



The screws are very small, so we suggest using one the PH00 bit to ensure you don't strip the screws. We'll need to reuse these screw to remount the USB connector on on printed part.

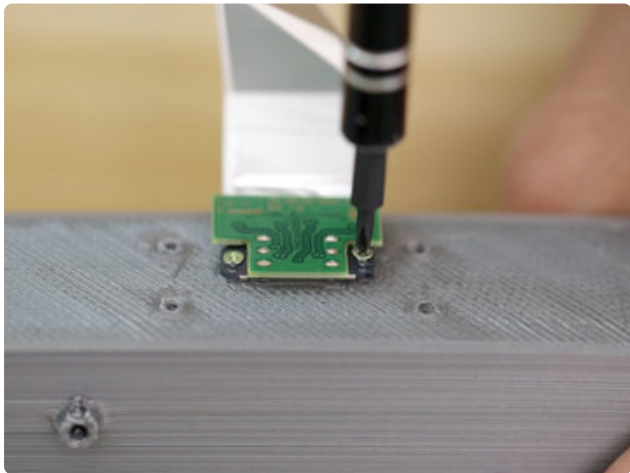
Once removed, we can then pull the USB pcb out.

Now we can work on mounting the components to the 3D printed dock.



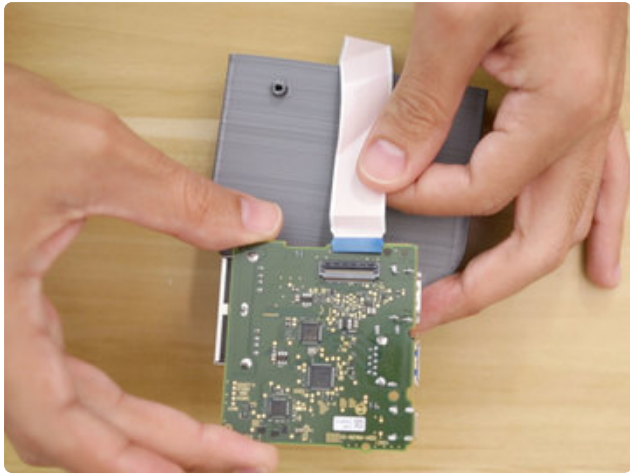
Before we begin, make sure to first create the threads on the mounting holes to make securing the USB connector easier.

Now we can start by inserting the USB-C connector to the bottom of the printed dock.

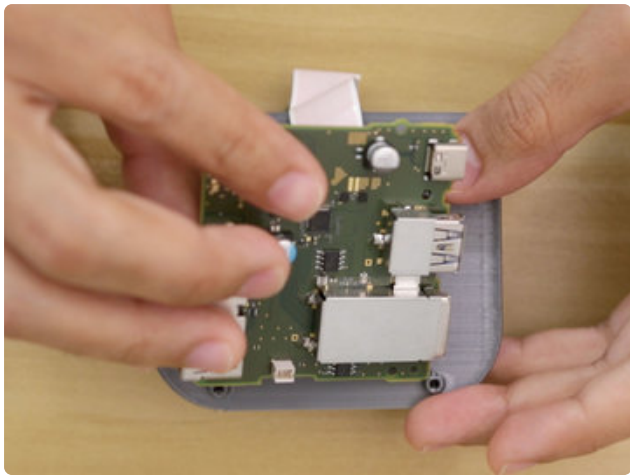


Reference the position of the USB ribbon cable to the picture of the side. We'll need the ribbon cable to face away from the standoffs on the side of the printed dock. The ribbon cable will then bend over the USB pcb towards the the standoffs on the the side of the printed dock.

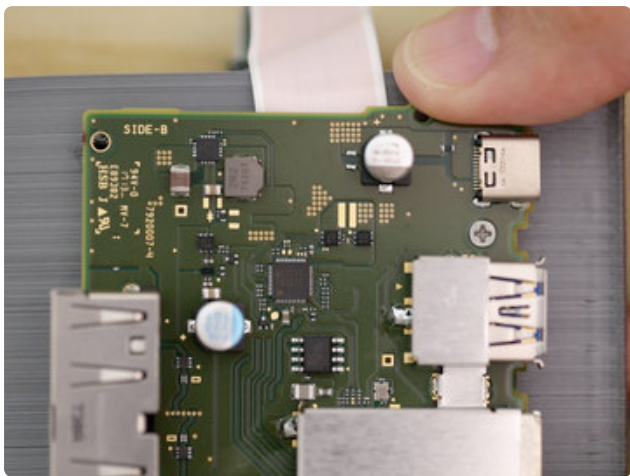
We'll repurpose these screws and use them to secure the USB pcb to the bottom of the dock.



Next we'll connect the ribbon cable back onto the main PCB making sure it's in the right orientation.



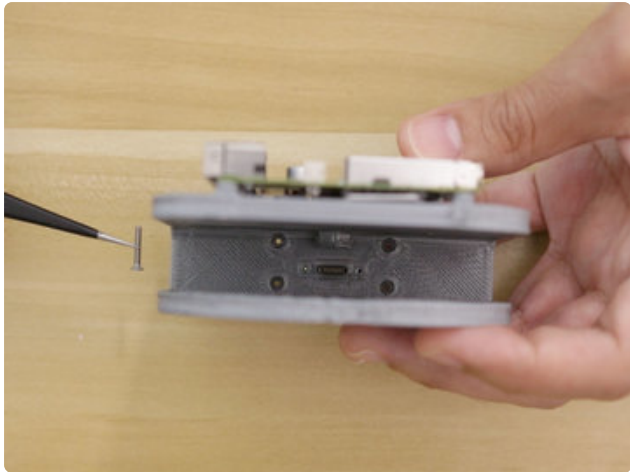
Insert the ribbon cable with the blue strip facing up and align and insert the two tabs into the sides. Close the latch and slightly pull on the ribbon cable to insure the ribbon cable is secured in place.



Flip the PCB over the standoffs on the side of the dock and line up the mounting holes. Hold the PCB in place while inserting and fastening the machine screws.



You can reuse the screws that came with the dock, but we used M2x5mm flat screws.

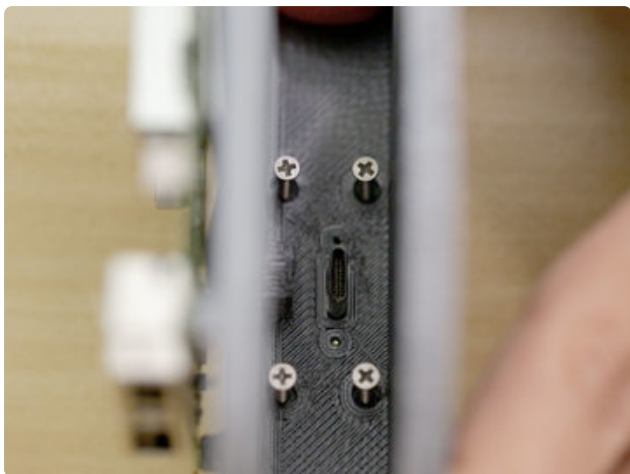


Using longer M2x12 screws and insert them from the top and fasten until slightly protruding from the bottom of the dock.



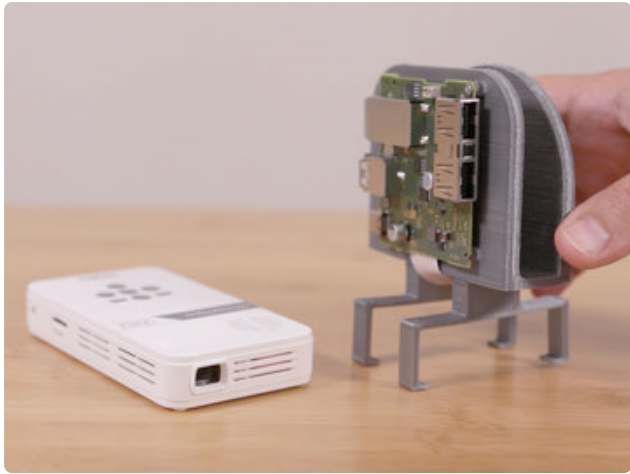
Make sure to pre thread the mounting holes before to adding screws into place. Use a tweezers to help hold the screws in place while positioning the screws over the mounting holes.

Then, install the brackets perpendicular with the dock.



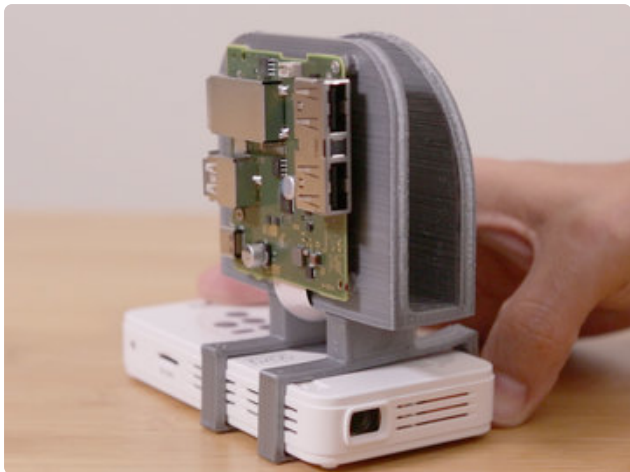
While holding them together, fasten the screws until fully tightened. We'll need to repeat this process for the second bracket.



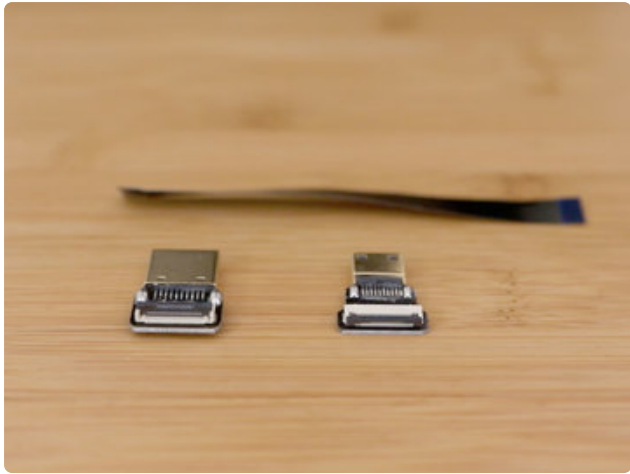


And that's pretty much it for the assembly. Of course you want to double check to make sure everything is tight and go ahead test it out.

Position the brackets away from the rubber feet on corners of the projector and away from the buttons on top.



Bend the one side the brackets and slide both over the projector. The two brackets can then simply slide onto the PICO projector.



For the HDMI connection we're using these DIY parts that are super slim and low profile.

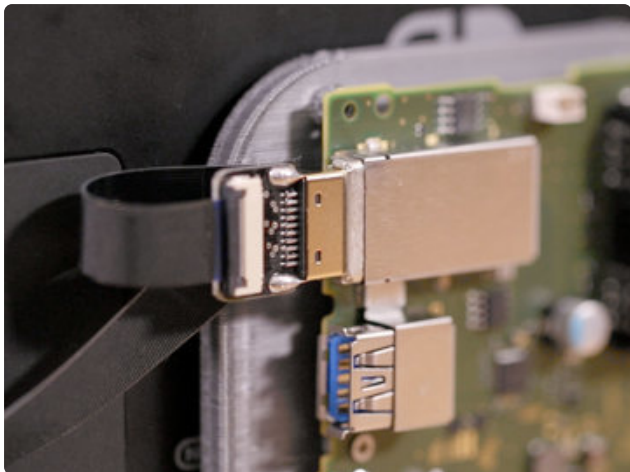
These bare PCBs have little locking latches so it's easy to make your own configuration.



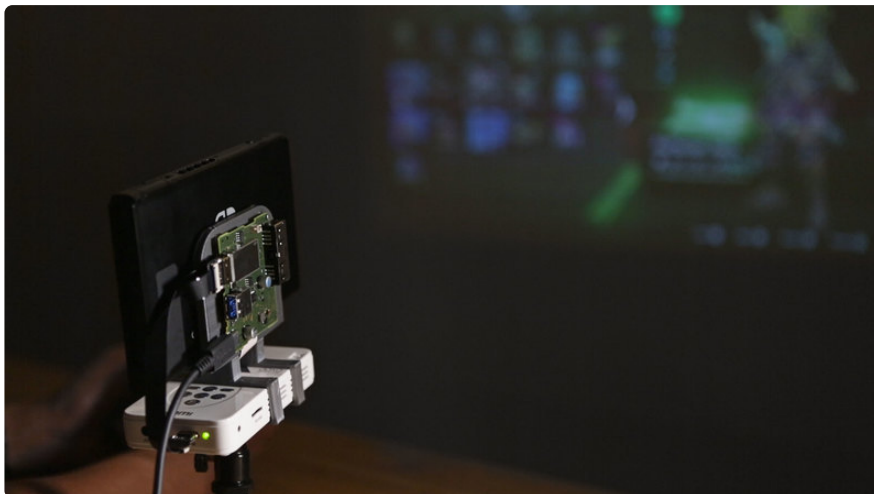
With the accompanying ribbon cable, we put together a regular HDMI to mini HDMI. These are surprisingly hardy once locked together.



The PICO project features a mini HDMI connector so we can plug in our cable and hook up the other end to the main PCB.



Any excess ribbon cable can be tucked underneath.



And that's pretty much it – Our little PICO projector isn't the brightest on the market but it is fairly inexpensive. We've had it laying around for awhile and thought we'd put it to use in this project.

We like to think of this as more of a prototype and proof of concept. We hope this inspires the DIY community to take a stab at making their own Mods for the Nintendo switch.

We had a lot of fun during the tearing down and hope it serves as a future reference for anyone looking to do something similar!