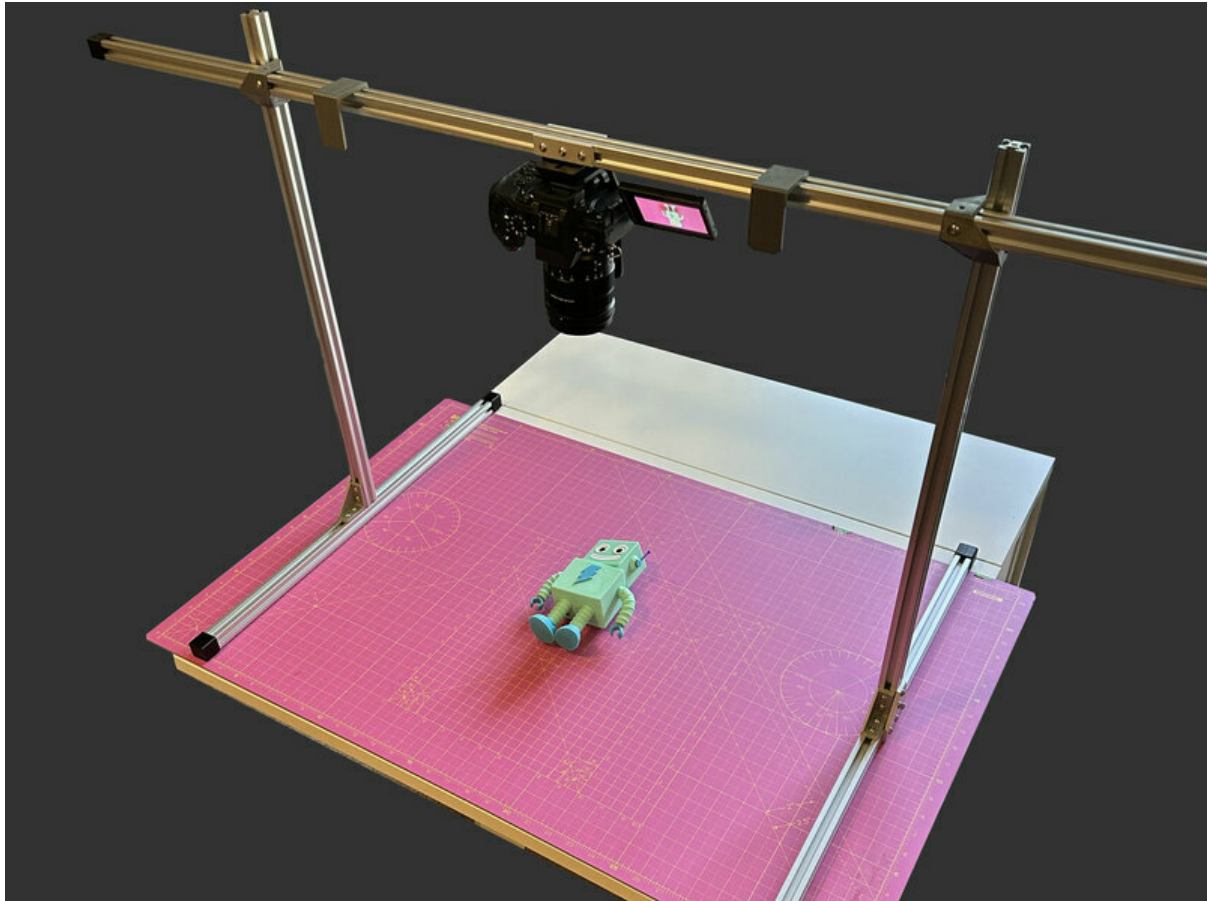




Overhead Camera Rig

Created by Ruiz Brothers



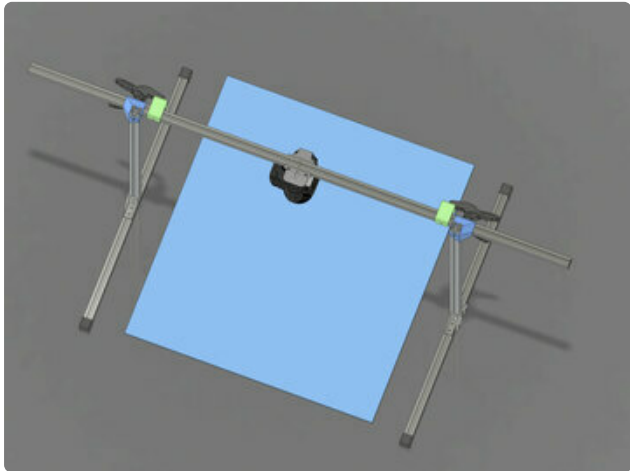
<https://learn.adafruit.com/overhead-camera-rig>

Last updated on 2024-06-03 03:53:37 PM EDT

Table of Contents

Overview	3
<ul style="list-style-type: none">• Top Down Photography• Backdrop Photography• Dimensions• Parts• Optional Parts• Tools	
CAD Files	6
<ul style="list-style-type: none">• CAD Assembly• 3D Printed Parts• Build Volume	
Assembly	7
<ul style="list-style-type: none">• Leg Assembly• Overhead Beam Assembly• Spring Clamp Holders for Backdrops• Cross Beam Assembly• Adjust Rig Length & Height• Attach Camera• Final Build• Expanding features	

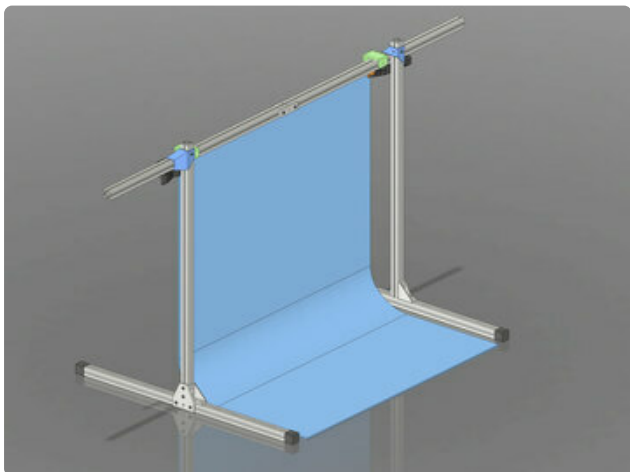
Overview



Top Down Photography

This project uses t-slot 20mm x 20mm aluminum extrusion beams (sometimes referred to as "2020") to build a framing system that can be used for mounting a camera, perfect for getting overhead photos.

Overhead photography is the cornerstone of documenting projects. In this guide, you learn how to use 2020 extrusion, hardware and 3D printed parts to build a simple yet modular mounting system.



Backdrop Photography

This system can also be used to hold up a backdrop for getting glamor product shots. Spring clamps can be used to hold up poster boards, paper or fabric.

The leg assemblies can slide along the t-slotted aluminum extrusion so it's adjustable for just about any standard size of poster boards.

Dimensions

The overall dimension can vary depending on the length of 2020 extrusions. The height and length of the rig can be adjusted by sliding the leg assemblies or the overhead beam.

- Leg length: 610mm (24in)
- Leg height: 630mm (24.8in)
- Overhead Length: 1220mm (48in)

Parts

Slotted Aluminum Extrusion - 20mm x 20mm - 610mm long

6 x 2020 Extrusion

<https://www.adafruit.com/product/1221>

Slotted Aluminum Extrusion - 20mm x 20mm - 610mm long

2 x T-Plate

<https://www.adafruit.com/product/1219>

T-Plate for 2020 Aluminum Extrusion

2 x Corner Brace

<https://www.adafruit.com/product/1259>

Double Corner Brace Support

2 x Coupling Plate

<https://www.adafruit.com/product/1216>

3 Holes - 20x20 Aluminum Extrusion

1 x M4 x 8mm screws

<https://www.adafruit.com/product/1160>

(28x required) Button Hex Machine Screw - M4 thread -
8mm long - pack of 50

1 x Slim T-Nuts

<https://www.adafruit.com/product/1157>

(28x required) M4 Thread - pack of 50

1 x End Caps

<https://www.adafruit.com/product/1156>

pack of 10

2 x M4 x 14mm screws

[https://www.mcmaster.com/
92095A193/](https://www.mcmaster.com/92095A193/)

Longer screws for camera L-Plate

Optional Parts

These parts can be used to mount a camera or backdrop.

1 x Spring Clamps

[https://www.amazon.com/HORUSDY-
Plastic-Opening-Clamping-Securing/
dp/B0BCJL2JB7/](https://www.amazon.com/HORUSDY-Plastic-Opening-Clamping-Securing/dp/B0BCJL2JB7/)

8-Pack

1 x L Bracket

[https://www.amazon.com/Vertical-
Horizontal-Switching-Compatible-
Stabilizer/dp/B09RB11GK5/](https://www.amazon.com/Vertical-Horizontal-Switching-Compatible-Stabilizer/dp/B09RB11GK5/)

Camera mounting plate with tripod quick release and
tripod screw

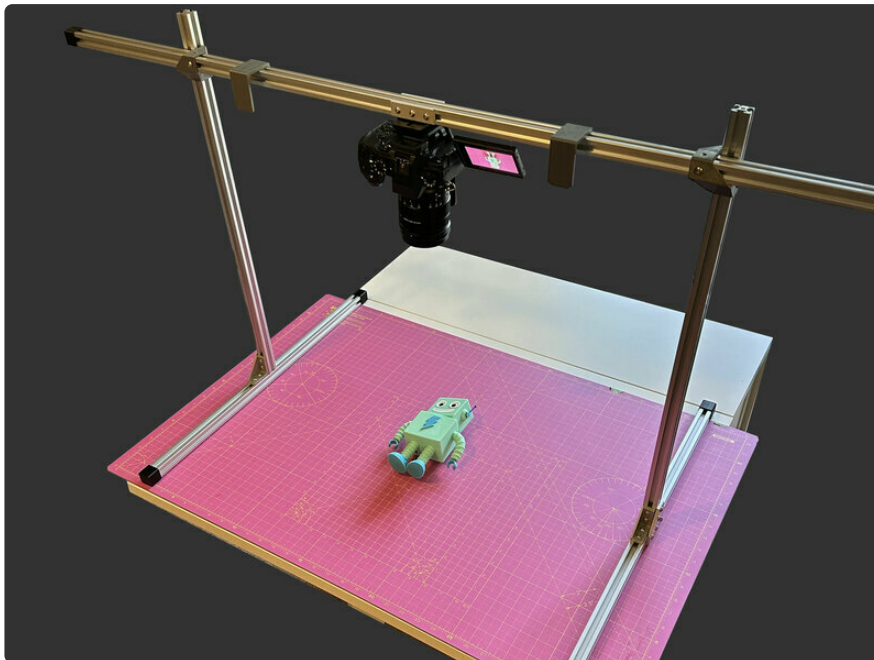
Tools



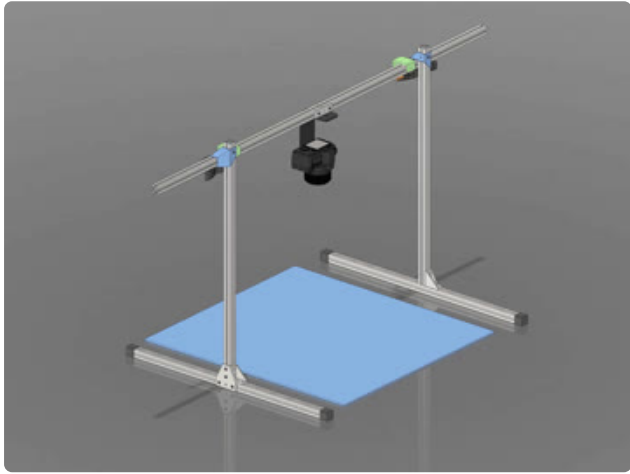
65 Piece Ratchet Screwdriver and Tool Bit Set

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 ratchet screwdriver set. This set is fine...

<https://www.adafruit.com/product/829>



CAD Files

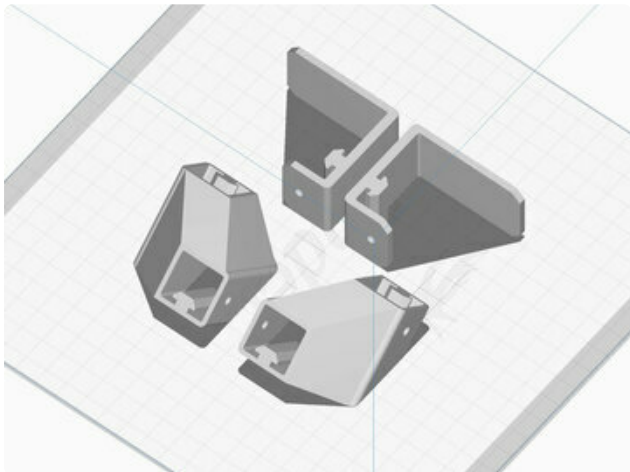


CAD Assembly

The two leg assemblies are made of two pieces of 2020 extrusion and joined using a T-plate and a corner brace.

The overhead beam is comprised of two pieces of 2020 extrusion and joined using a coupler plate.

The overhead beam slots into the leg assemblies using a 3D printed tube coupler.



3D Printed Parts

These parts require a 3D printer. STL files for 3D printing are oriented to print "as-is" on FDM style machines. Parts are designed to 3D print without any support material using PLA filament. Original design source may be downloaded using the links below.

Cross Connector.stl

Cross Connector(Mirror).stl

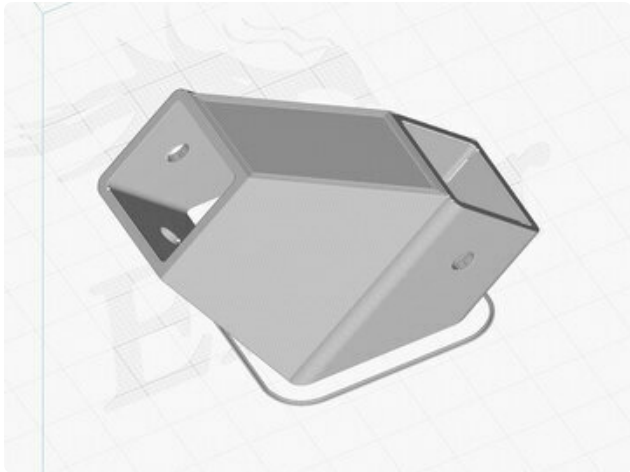
Clamp Holder.stl

[Download CAD source](#)

<https://adafru.it/18Se>

[Download STLs.zip](#)

<https://adafru.it/18Sf>



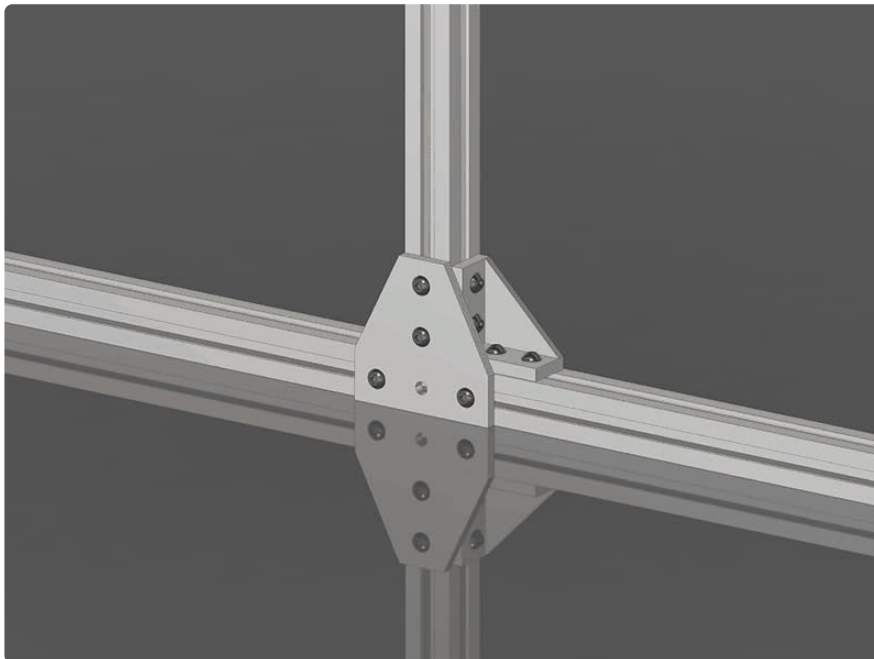
Build Volume

The parts require a 3D printer with a minimum build volume.

120mm (X) x 118mm (Y) x 34mm (Z)

Assembly

Leg Assembly



To build a leg assembly, start with two pieces of 2020 extrusion, a T-plate, and a corner brace. Get eight M4 x 8mm long screws, and eight slim M4 T-nuts.

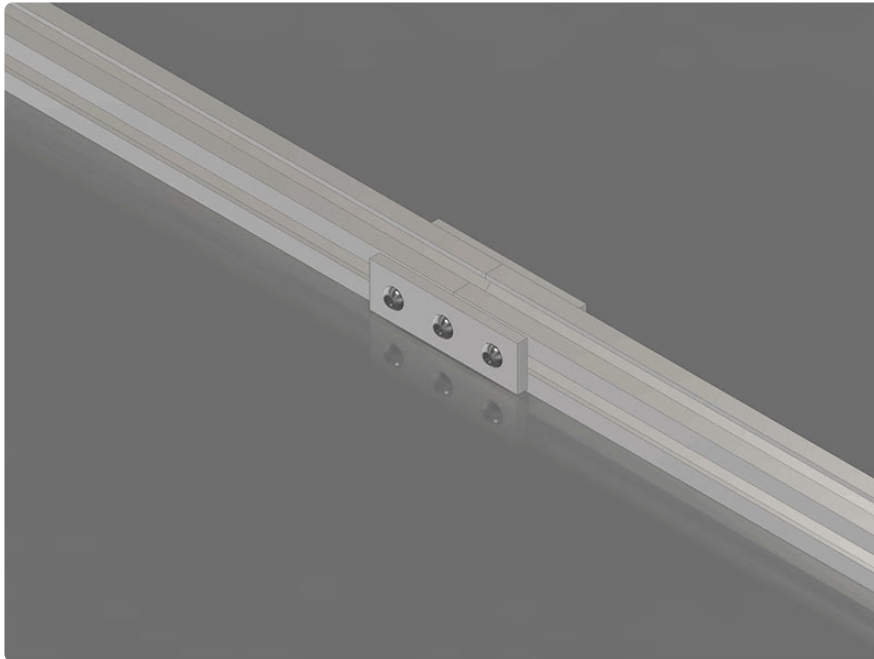
1. Position the two extrusions in the form of a "T".
2. Place the T-plate over the two extrusions and line up the mounting holes with the center T-slots.
3. Insert and position the slim M4 nuts into the T-slots. Align the T-nuts with the T-plate mounting holes.
4. Insert and fasten the M4x8mm long screws.
5. Place the corner brace onto the assembled extrusions.

6. Insert and position the slim M4 nuts into the T-slots.
7. Insert and fasten the M4x8mm long screws.

Repeat this process for a second set of legs.

Tip: Use tweezers or spudger tool to position the slim T-nuts into the T-slots.

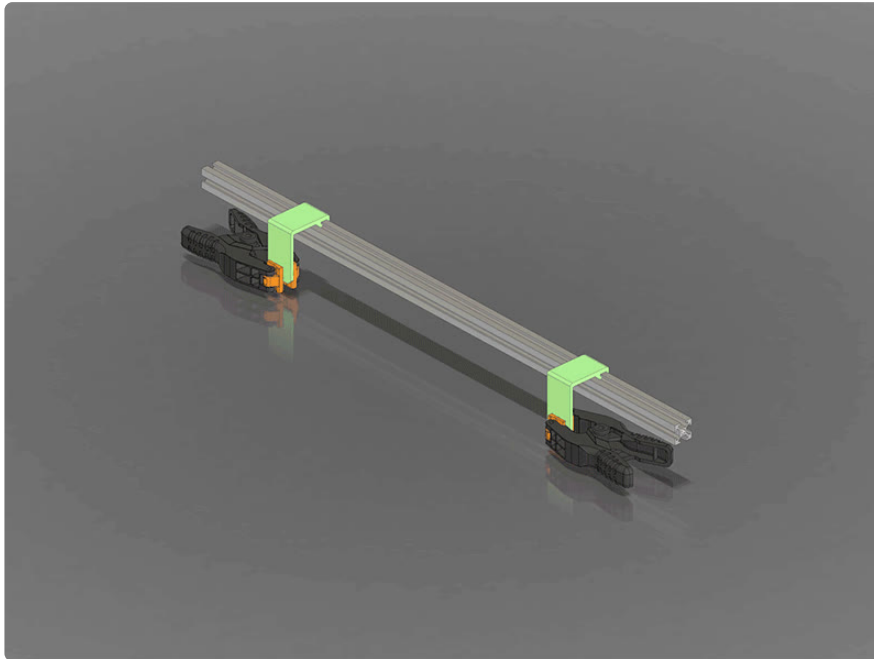
Overhead Beam Assembly



You'll join two lengths of beam to create the wide overhead span. Get two pieces of 2020 extrusion, and two coupler plates. Use six M4 x 8mm long screws, and six slim M4 T-nuts.

1. Position two pieces of 2020 extrusion end to end.
2. Place a coupler plate over the two extrusions and line up the mounting holes with the center T-slot.
3. Insert three M4 slim T-nuts and line up the mounting holes.
4. Insert and fasten three M4 x 8mm long screws into the T-nuts
5. Repeat process for the second coupler plate.

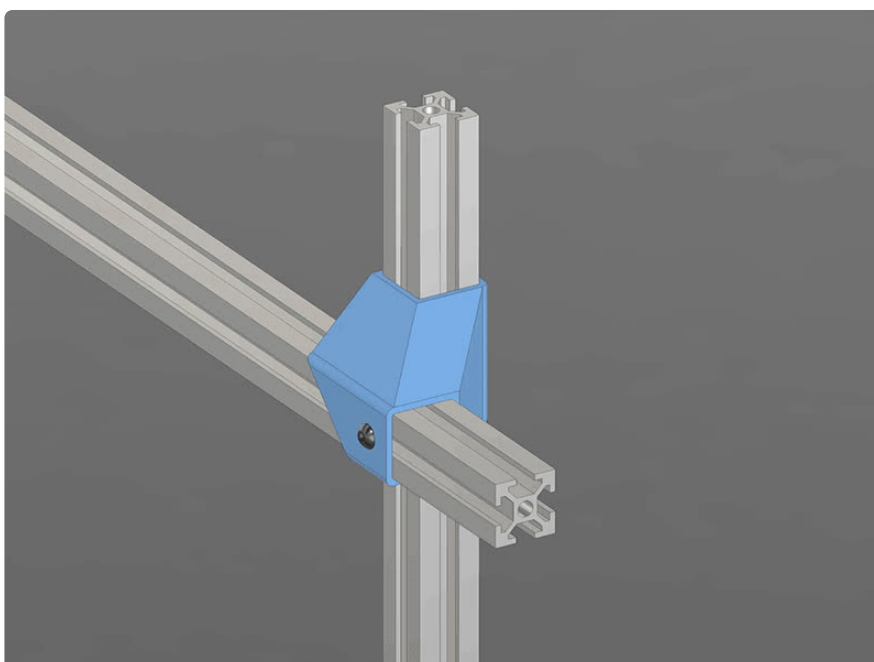
Spring Clamp Holders for Backdrops



Use the clamp holders to secure a backdrop to the overhead beam. Slide the clamp holder onto the t-slot with the long flap oriented in the desired position. Place the top of the backdrop onto the long flap and use a spring clamp to keep it in place.

Add the clamp holders before continuing with assembly.

Cross Beam Assembly



Get the two leg assemblies you already made, one of the 3D printed cross connectors, two M4 x 8mm long screws, and two M4 slim T-nuts.

1. Orient the cross connector and insert a leg assembly through the y-axis.
2. Insert the overhead beam through the x-axis on the cross connector.
3. Insert the M4 slim T-nuts through the T-slots and line up the mounting holes.
4. Insert and fasten M4 x 8mm long screws to secure the extrusion to the cross connector.
5. Repeat this process for the second leg assembly.

Adjust Rig Length & Height



The leg assemblies can slide along the overhead beam to adjust the width of the rig. The overhead beam can slide along the leg assembly to adjust the height of the rig. Use the screws in the cross bracket to lock the legs and overhead beam.

Attach Camera

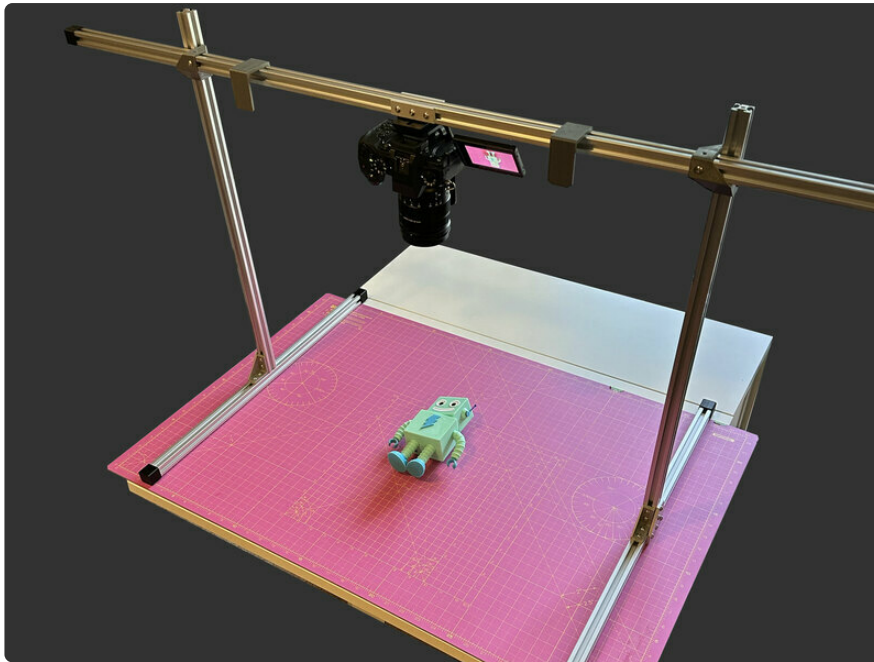


Get the L-plate camera mount, camera and two M4 x 10mm screws and slim T-nuts. Attach the L-plate camera mount to the overhead beam using the M4 screws and slim T-nuts. Use the L-plate included tripod screw to secure your camera.

Final Build

Congratulations on your build! You can finish things off by capping the ends of the beams.

The rig can be broken down and stored away by removing the overhead beam from the two leg assemblies.



Expanding features

Since this build uses 2020 extrusion, it's open to more capabilities! Want to mount LED panels or an external display monitor? Create your own mounting plates and brackets!