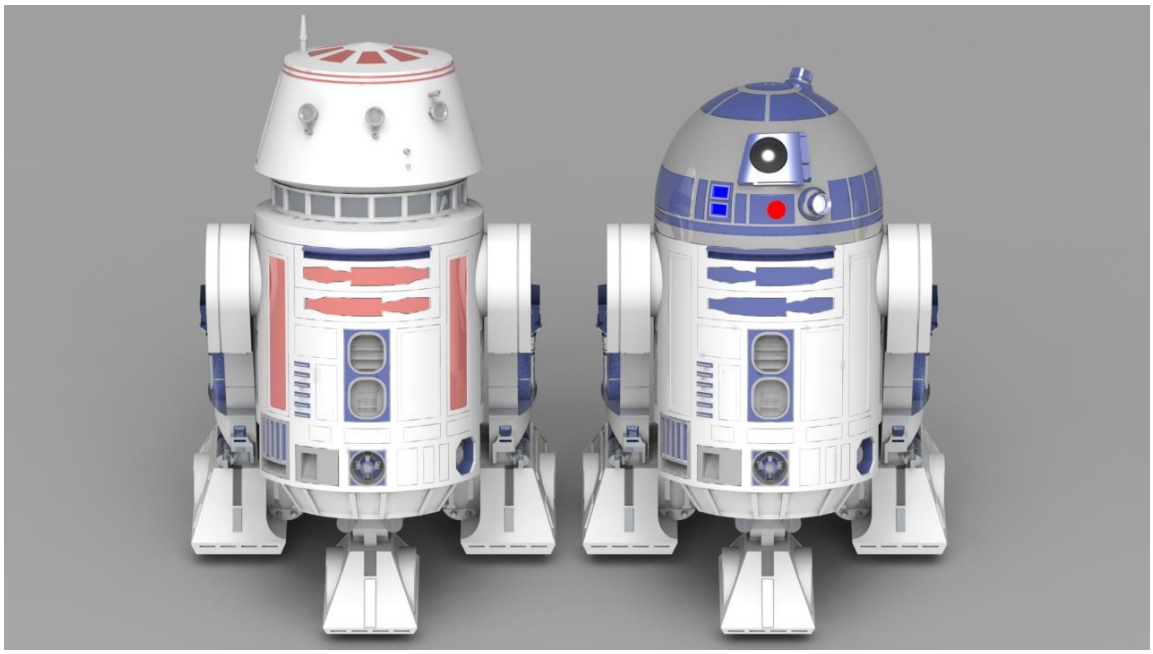
Mini R2-D2/ R5-D4 Guide by Matt Zwarts



This is the guide for printing and assembling a mini R2-D2 or R5-D4 that I designed in collaboration with Michael Baddeley's original models, 3D printed body, simple electronics and controlled via Bluetooth smartphone app or your own device RC transmitter. Thanks to Colin Dick for doing the test prints before release.

Review the part and recommended settings for printing to keep weight and strength optimized before printing and post some pics of you build in the Facebook Group.

https://www.facebook.com/groups/MrBaddeley/about/

Shout me a coffee of some filament costs if you like to keep adding to my designs and builds that I enjoy sharing

https://paypal.me/Matteous78?locale.x=en_AU

Happy Building,

Matthew Zwarts

Contents

Printer Settings

All the prints I did where with PLA + material, use your own print temperatures and machine based settings.

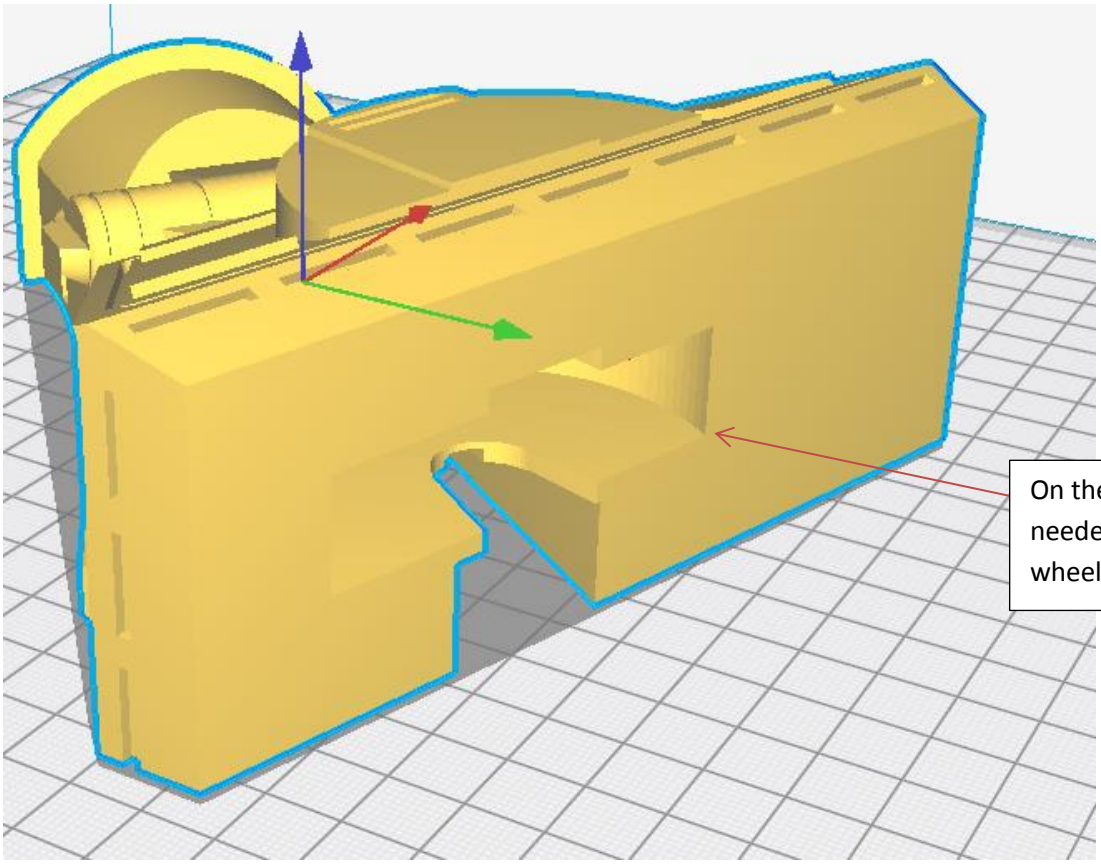
I estimated it used about 2- 2.5kg of PLA+ filament to print all the parts.

The below settings are recommended to keep strength optimized and weight minimized.

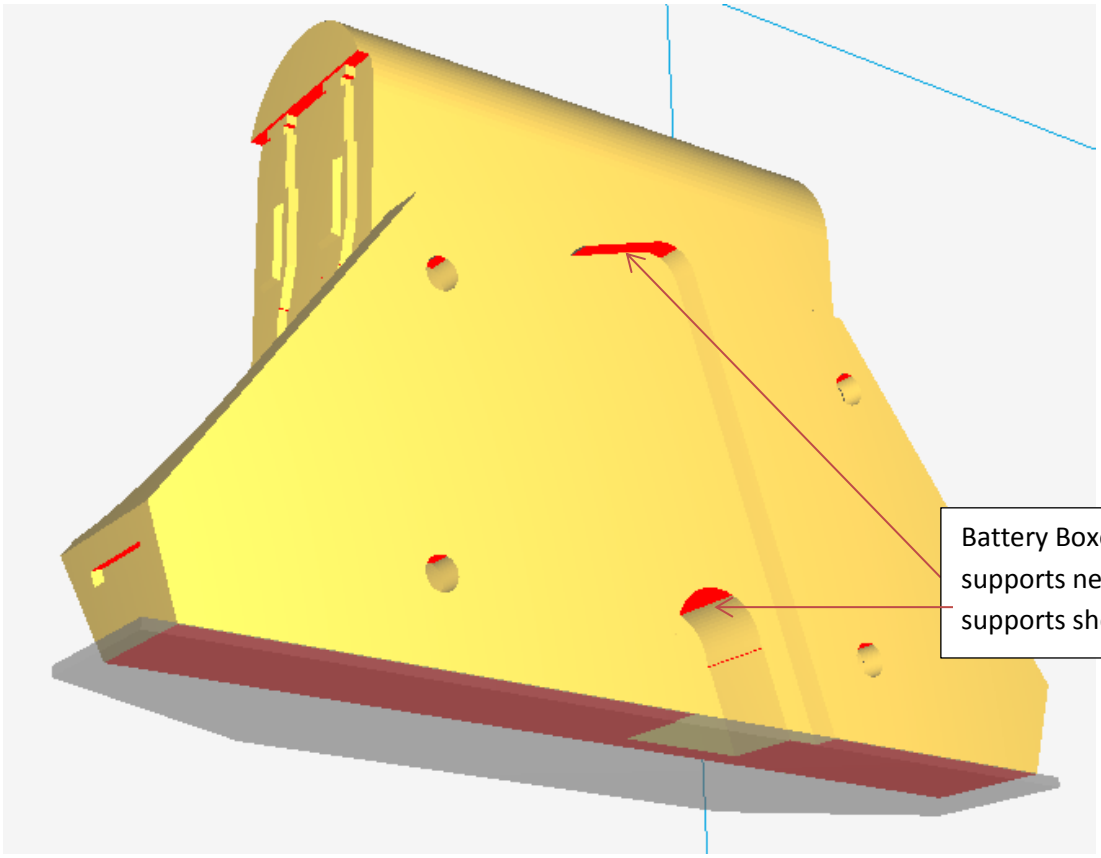
The parts should come in to the slicer in the correct orientation for printing.

Part Name	Quantity	Supports	Overhang Value	Infill %	Notes
MZ Wheel Rev 2.STL	2	Yes	65	30	
MZ R2_D2_Body.STL	1	No		10	Print at 0.2 layer height for crisper detail
MZ R2-D2 Centre Foot.STL	1	Yes	65	30	
MZ R2-D2 Centre Foot Ankle Cylinders x 2.STL	2	Yes	65	15	
Front Caster Axle.STL	1	No		50	
Front Castor Fork.STL	1	No		50	
Front Castor Tyre.STL	1	No		50	
MZ R2_D2 Left Leg Upper.STL	1	No		15	*
MZ R2_D2 Left Battery Box.STL	1	Yes	65	15	
MZ R2_D2 Left Leg Lower.STL	1	Yes	65	15	*Supports mainly needed in wheel arch
MZ R2_D2 Right Battery Box.STL	1	Yes	65	15	
MZ R2_D2 Right Leg Lower.STL	1	Yes	65	15	*Supports mainly needed in wheel arch
MZ R2_D2 Right Leg Upper.STL	1	No		15	*
Dome Centre Spider.STL	1	Yes	65	30	
Mini Droid R2 Dome.STL	1	No		15	Print at 0.2 layer height for crisper detail
Mini Droid R2 Dome Holoprojector x 3.STL	3	No		15	
R2 Dome HoloProjector Lens x 3.STL	3	No		15	Print in Clear PLA or with low infill and 2 top and bottom layers
Dome Axle.STL	1	No		30	
Dome Gear.STL	1	No		30	

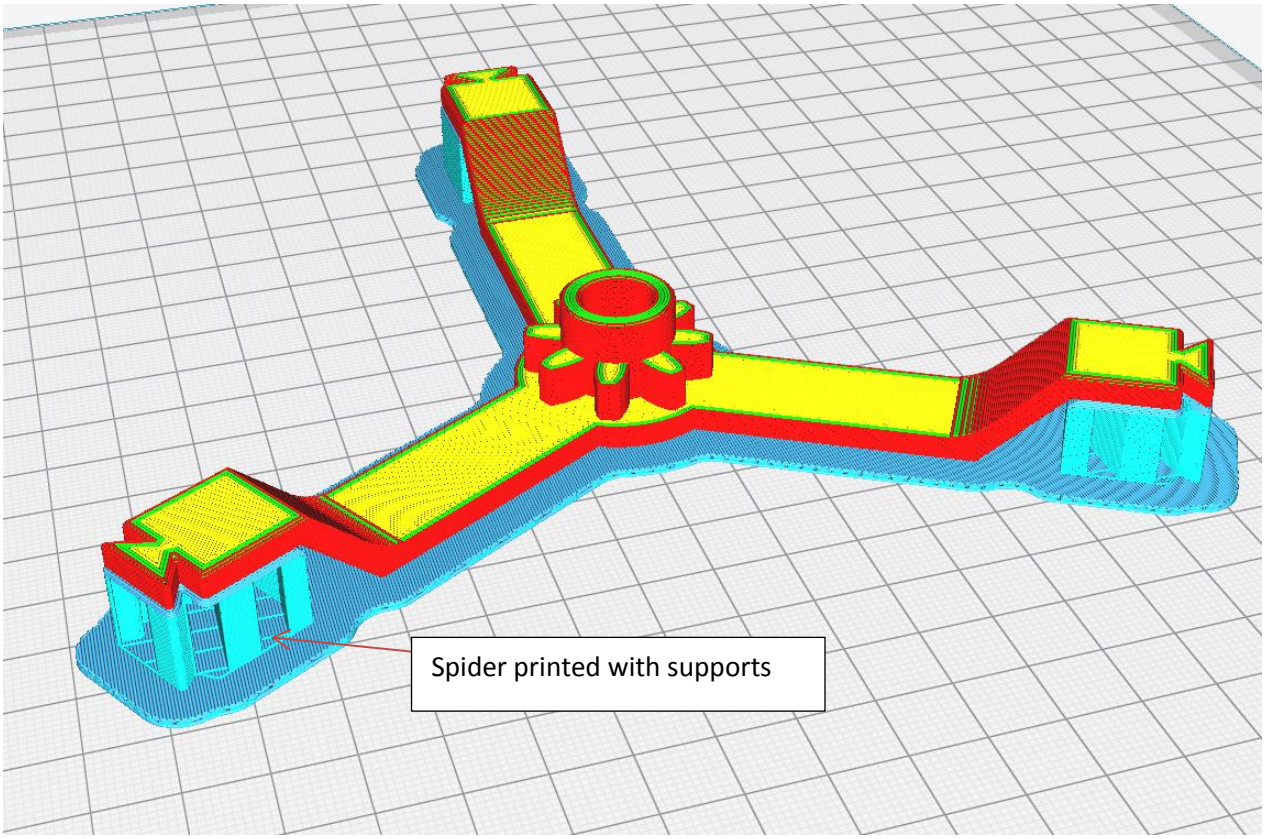
- Note: there is a single print leg of each side for larger printers, it will require supports in the wheel archers

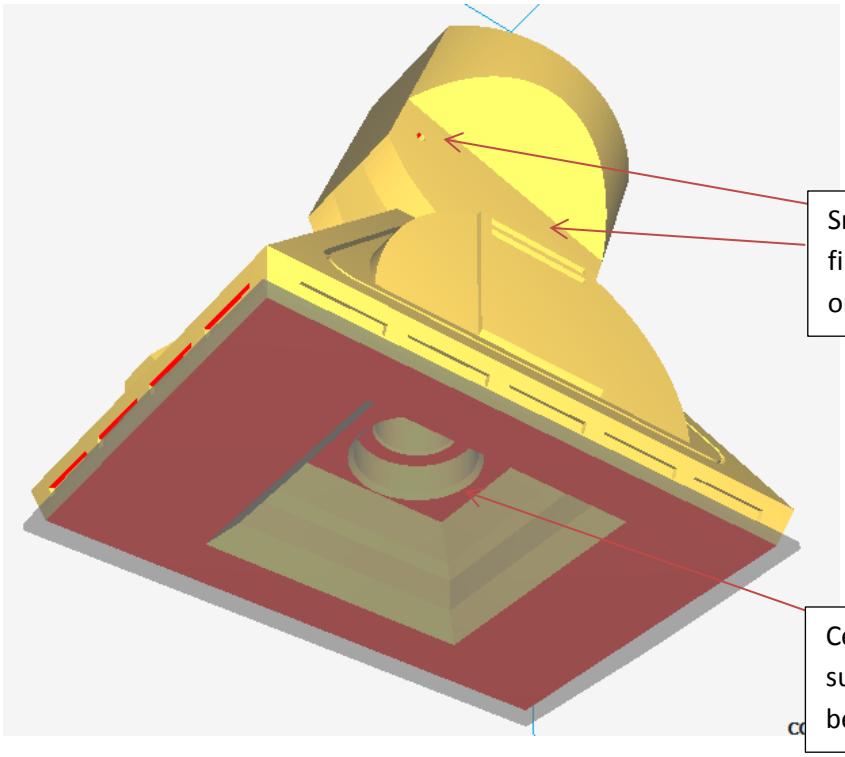


On the Lower legs support is only needed on this large area for the wheel cavity

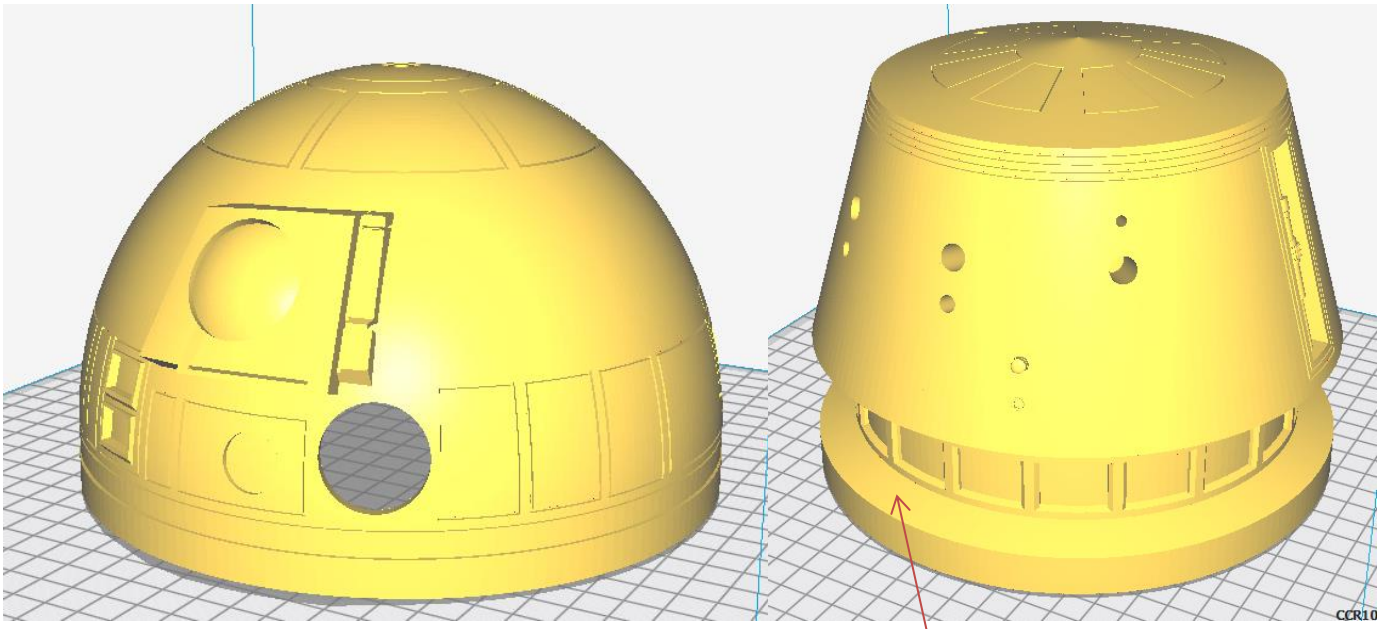


Battery Boxes printed vertical with supports needed in a few places, auto supports should be fine

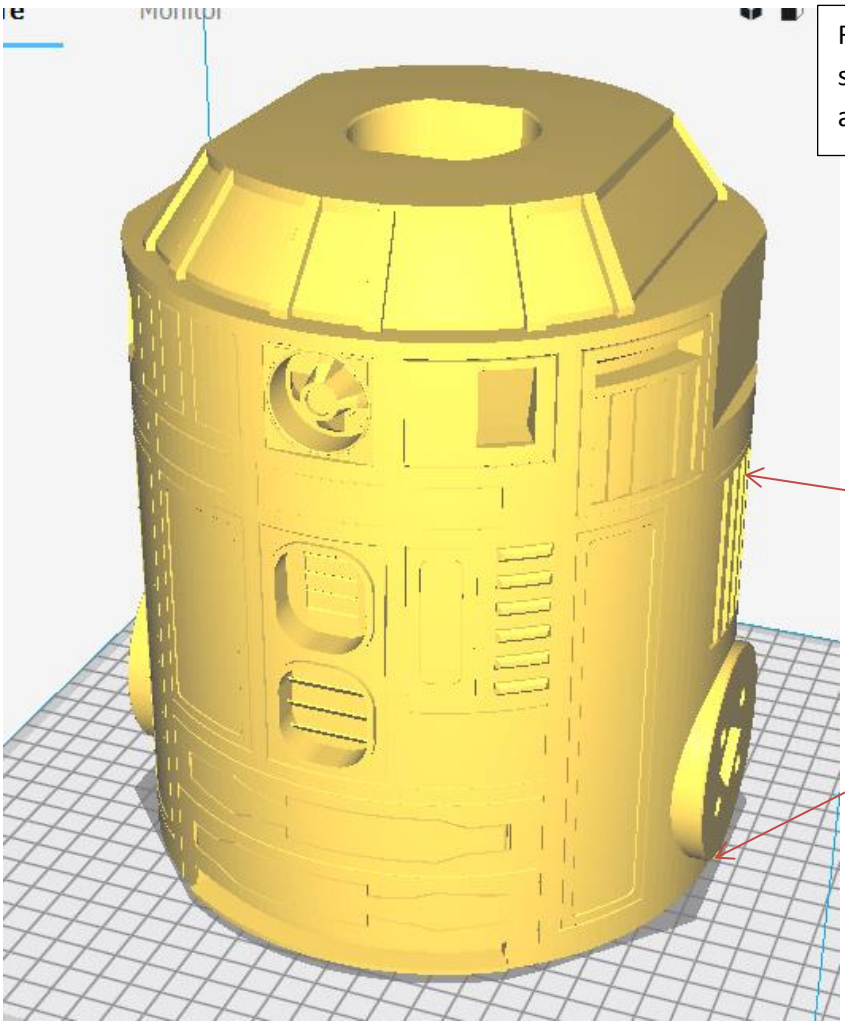

Spider printed with supports


Small holes for 1.75mm filament location pins to glue onto ankle cylnders
Centre foot printed with supports underneath for bearing

The dome and body are printed upside down with no supports, print at 0.2mm layer height for finer details.



R5 and R2 domes need no supports, supports built into print and accessories printed separately



The body does not need supports

2 small pieces need to be removed at the bottom of the shoulders after printing

Electronics

Electronics BOM – for Bluetooth setup

Part Name	Quantity	Source	Link	Comments
HC-05 Bluetooth Module	1	Banggoods	https://www.banggood.com/HC-05-Wireless-Bluetooth-Serial-Transceiver-Module-Slave-And-Master-p-908621.html?rmmds=search&cur_warehouse=CN	
Arduino Nano	1	Banggoods	https://www.banggood.com/NANO-IO-Shield-Expansion-Board-Nano-V3-Improved-Version-No-Cable-For-Arduino-p-1010994.html?rmmds=search&cur_warehouse=CN	Arduino Clone will be fine
Toggle switch (on-off)	1	Any	https://www.banggood.com/Red-3-Pin-ON-ON-SPDT-Mini-Toggle-Switch-AC-6A125V-3A250V-p-967014.html?rmmds=search&cur_warehouse=CN	Any toggle switch for on/ off
MX1508 Motor Driver Board	2	Banggoods	5pcs Dual Channel L298N DC Motor Driver Board PWM Speed Dual H Bridge Stepper Module Module Board from Electronic Components & Supplies on banggood.com https://banggood.app.link/WfcEpe8eJ81167075.html?rmmds=search&cur_warehouse=CN	can be labelled as a L298 but isn't
DC 3V-6V DC 1:120 Gear Motor	3	Banggoods	https://banggood.app.link/a6OjtswUU8	I just buy 5 or more at a time almost the same price
7.4v 3 cell Lipo 800mAh	1	Banggoods	https://www.banggood.com/ZOP-Power-11_1V-800mAh-25C-3S-Lipo-Battery-JST-Plug-p-967263.html?rmmds=search&cur_warehouse=CN	Larger battery will be fine so long as it fits, just 7.4 volt
Wire	-	Any	-	Various wire for connecting everything
Resistor 1K Ohm	3	Any	See wiring schematic for Voltage divider	Any 3 resistors of equal value will work for the voltage divider

The total cost for electronics is around $35 AUD, wire is extra and assumed you have basic tools like a soldering iron and so on.

Click on the Links to go to where I purchased the parts from.

Hardware

Hardware BOM

Part Name	Quantity	Source	Comment
M6 x 25 Long SHCS	8	Hardware store	I got my bolts from used filament spools, Esun PLA+, recycled!
M6 nuts	8	Hardware store	
Bearings 22mm OD x 8mm ID x 7mm	3	Hardware store	
Various wood screws	8	Hardware store	the ones I used were 8G x 20mm long, this holds the footshells together
Small wood screws	-	Hardware store	Hold on the motor for the dome rotation, could be just hot glued
M4 grub screw 10mm long	1	Hardware store	Retain the dome gear onto the motor
M4 nut	1	Hardware store	Retain the dome gear onto the motor

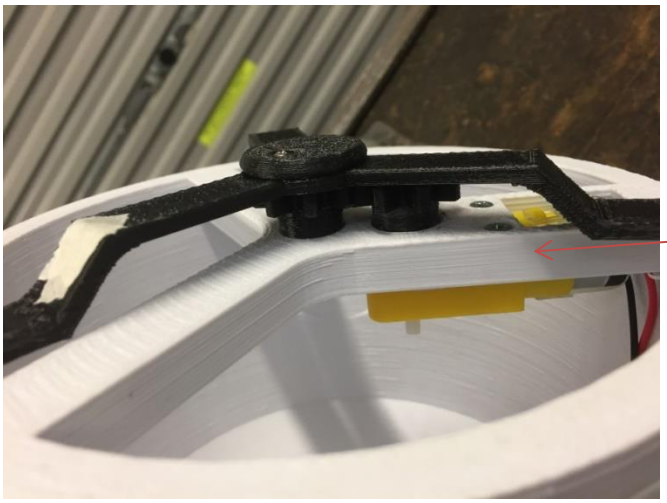
Very minimal hardware is required, I recycled the bolts from the filament spools… the wood screws I used were 20mm long wood screws, about 4mm Outside diameter on the thread.

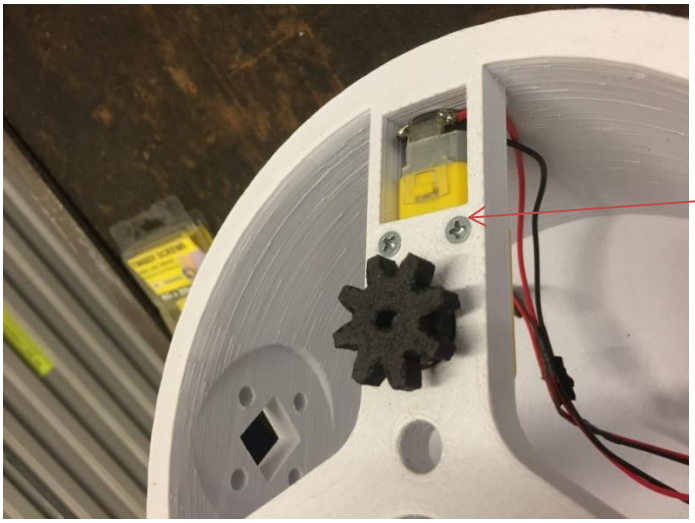
The bearings are pressed into the front tyre and 1 are used in the front wheel pivot

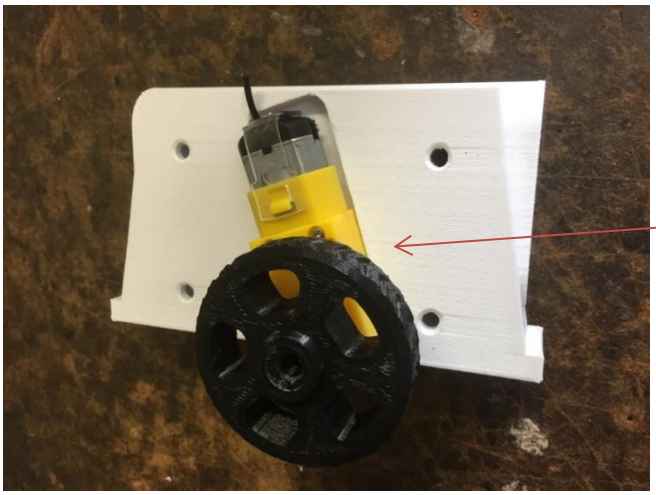
Assembly

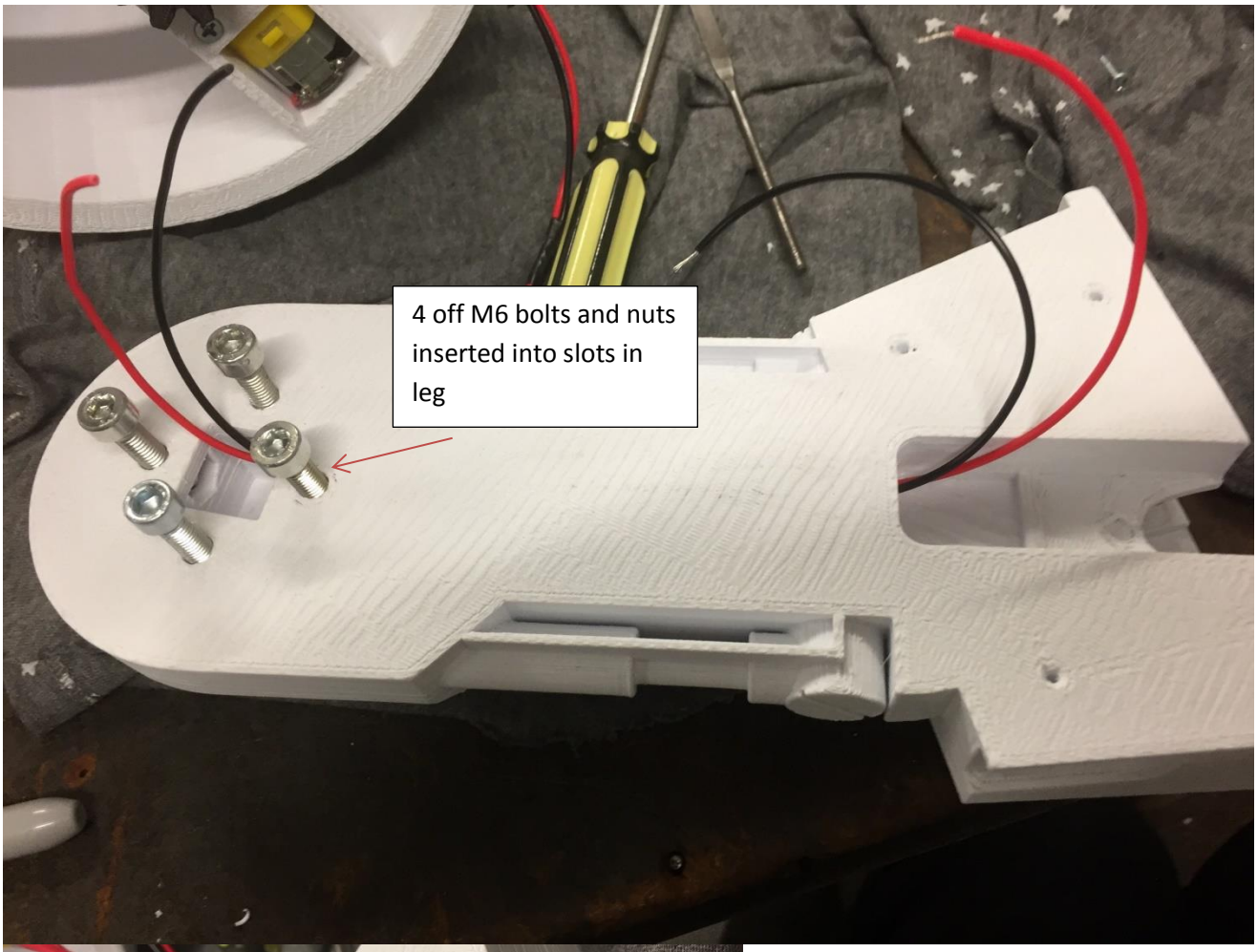
Please refer to the PDF assembly drawing **Mini R2 Assembly by Matt Zwarts Version 1.PDF**

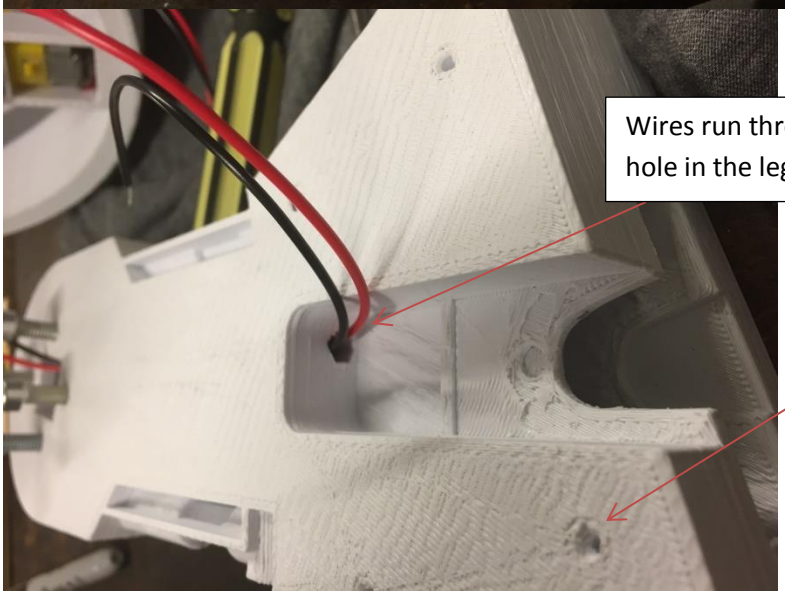
Chopper Assembly shown for reference







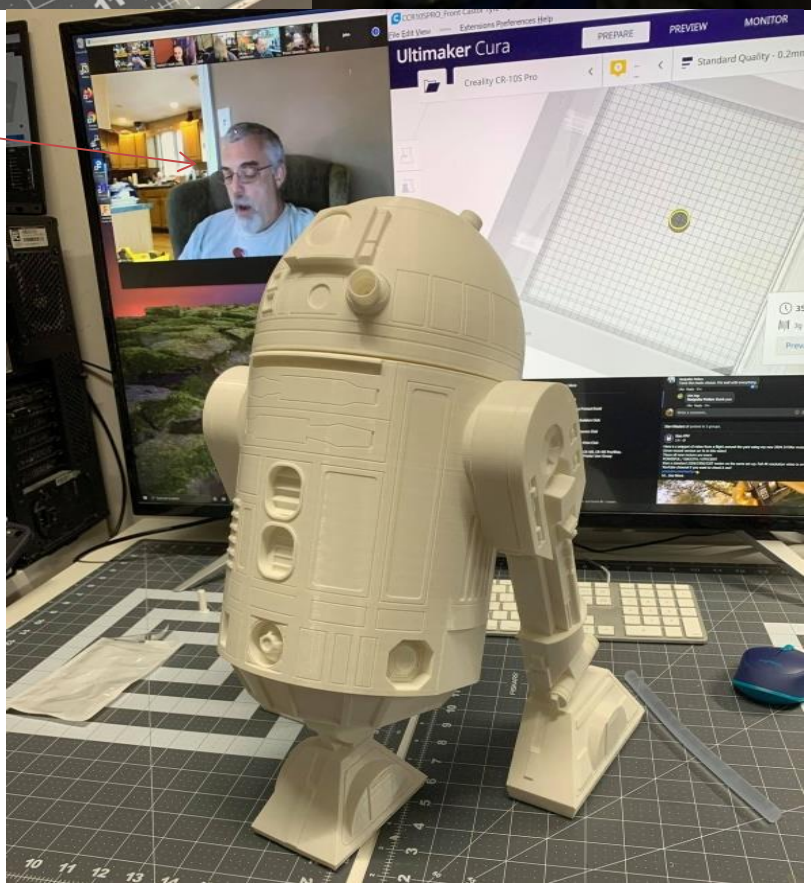

4 off M6 bolts and nuts inserted into slots in leg


Wires run through a hole in the legs
4 screws through from other side to screw into the side of each leg, no screw is required in the motor, a small step in the leg print holds the motor from sliding up.

Dovetail Joints

Glue together after a fitment check and may need a light file in corners

Caution: A wild Rick may appear during your build



The mini droid domes are all interchangeable:

- R2-D2
- R5-D4
- C1-10P
- CH-33P