

MrBaddeley R2D2 Version 2 Leg(s) Instructions Version 1.0

For other parts and instructions use the link below.

WWW.Patreon.com/mrbaddeley

R2 Printed build, MK2 and V2 Overview

<https://youtu.be/VL6NjYcGnEg>

Rev1.0DW

R2D2 Leg Features

CSR Spec

Note: Two Ankle options are available.

You only need one version. The “long” ankle version is for the 2-3-2 builds to allow extra clearance for the Battery Box / Skirt.

The “standard” ankle version has a standard length leg for fixed leg builds.



Space for magnets (10mm x 5mm rare earth Magnets) for shoulders & booster covers

Two Lengths (different ankles) one for standard fixed Legs and a longer version for 2-3-2 models.

Fixings for shoulders

Cable runs for motor control

Run for foot locking bar

Pegs for booster cover

Boosters

- Left Booster
 - LBoosterCFrame – Qty.1
 - LBoosterLeg1 – Qty. 1
 - LBoosterLeg2 – Qty. 1
 - LboosterMain – Qty.1
 - LBoosterPlateFA – Qty. 1
 - LBoosterPlateFB – Qty. 1
 - LBoosterTop – Qty. 1
- Right Booster
 - RBoosterCFrame – Qty. 1
 - RBoosterLeg1 – Qty. 1
 - RBoosterLeg2 – Qty. 1
 - RboosterMain – Qty. 1
 - RBoosterPlateFA – Qty. 1
 - RBoosterPlateFB – Qty. 1
 - RBoosterTop – Qty. 1

Greebles

- Ankle Cylinder Holder – Qty. 2
- Ankle Cylinder Wedge – Qty. 2
- Ankle Det – Qty. 2
- Ankle Det B – Qty. 2
- Cylinder 1 – Qty. 2
- Cylinder 2 – Qty. 2
- Left Centre Hub – Qty. 1
- Leg Strut A – Qty. 2 (Long & Standard)
- Leg Strut B – Qty. 2 (Long & Standard)
- Left Ring Hub – Qty. 1
- RAnkle Bracelet – Qty. 2
- Right Centre Hub – Qty. 1
- Right Ring Hub – Qty. 1
- Right Shoulder Hydr – Qty. 1
- Shoulder Button – Qty. 4
- Shoulder Stabilizer – Qty. 2

Horse Shoes

- Right Horseshoe
 - RHorseshoeLeft
 - RHorseshoePlateLeft
 - RHorseshoePlatetop
 - RHorseshoeRight
 - RhorseshoeTop

- Left Horseshoe
 - LHorseshoeLeft
 - LHorseshoePlateLeft
 - LHorseshoePlatetop
 - LHorseshoeRight
 - LhorseshoeTop

Leg Parts List

Left Leg

- Right Ankle Back – Qty. 1 (Long or Standard)
- Right Ankle Curve – Qty. 1 (Long or Standard)
- Right Ankle Hinge – Qty. 1 (Long or Standard)
- Right Center Leg – Qty. 1
- Right Bolt Insert – Qty. 4
- Right Lower Leg – Qty. 1
- Right Lower Shoulder – Qty. 1
- Right Side plate 1 Bottom – Qty. 1
- Right Side plate 1 Top – Qty. 1
- Right Side Plate 2 Bottom – Qty. 1
- Right Side Plate 2 Top – Qty. 1
- Right Top Shoulder – Qty. 1

Right Leg

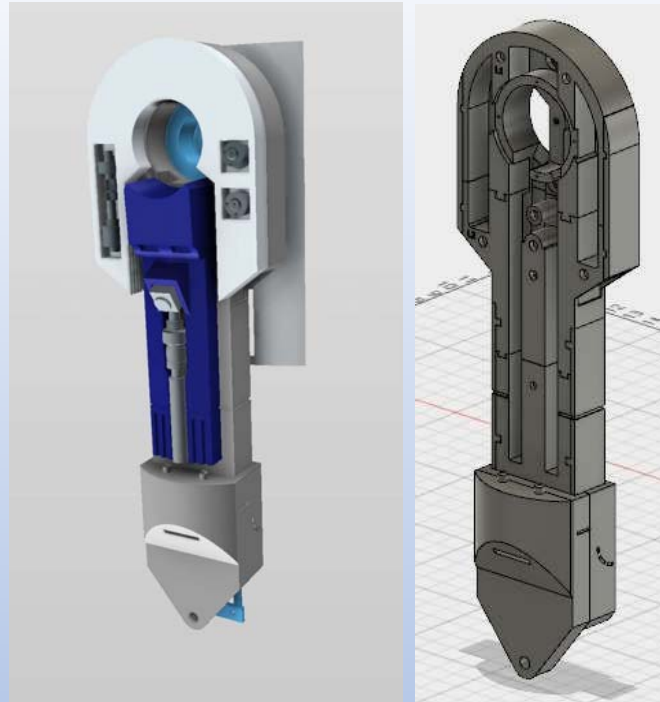
- Left Ankle Back – Qty. 1 (Long or Standard)
- Left Ankle Curve – Qty. 1 (Long or Standard)
- Left Ankle Hinge – Qty. 1 (Long or Standard)
- Left Center Leg – Qty. 1
- Leg Bolt Insert – Qty. 4
- Left Lower Leg – Qty. 1
- Left Lower Shoulder – Qty. 1
- Left Side plate 1 Bottom – Qty. 1
- Left Side plate 1 Top – Qty. 1
- Left Side Plate 2 Bottom – Qty. 1
- Left Side Plate 2 Top – Qty. 1
- Left Top Shoulder – Qty. 1

Leg Hardware List

- 6 x 10mm x 5mm rare earth magnet disc – Qty. 12
- 1.75mm filament for alignment
- 6mm Bearing
- 100mm Lazy Susan

R2D2 LEGS

Based CS:R specs. It is a fully printed droid and the internal fittings may not work with the standard club build but may fit with modification.



Firstly, the basics... each leg is made up of 11 main structural parts.

Recommended 3 layers, 10% infill with a 0.3 layer height. (You can print at higher resolution but it will take ages with no much difference in overall quality. This has been designed to minimize the visible layers when printing at low resolution to speed up the process. The frame is very clean and detailed at 0.3).

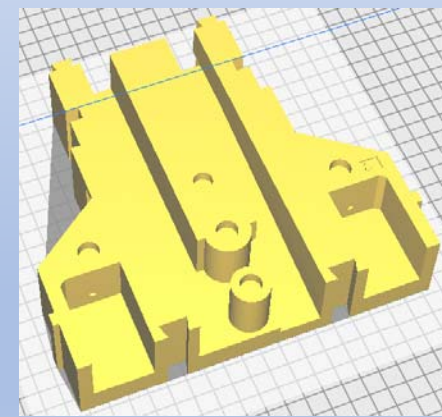
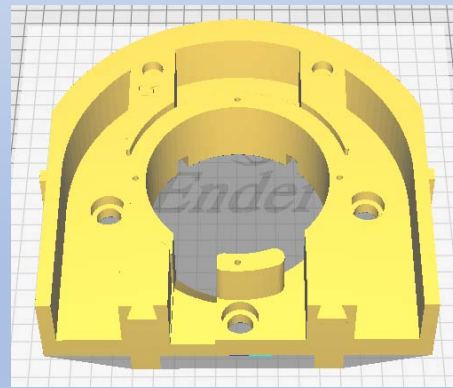
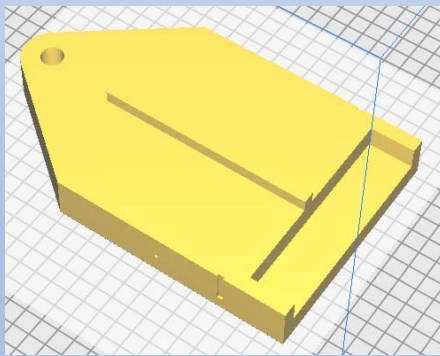
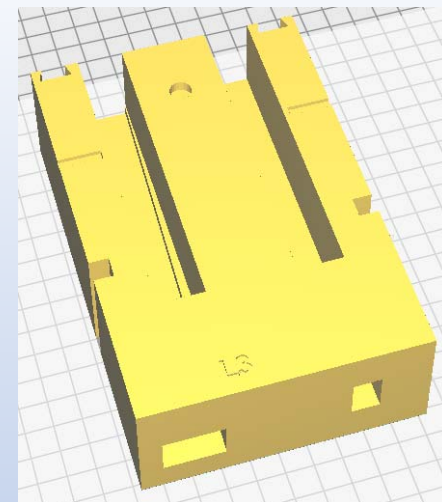
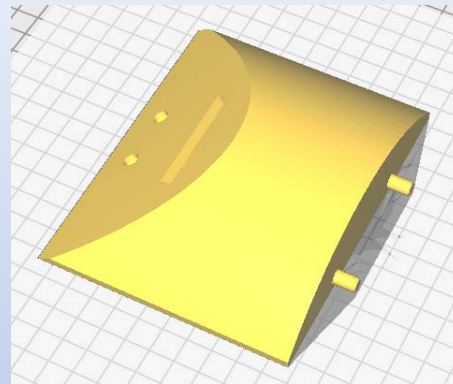
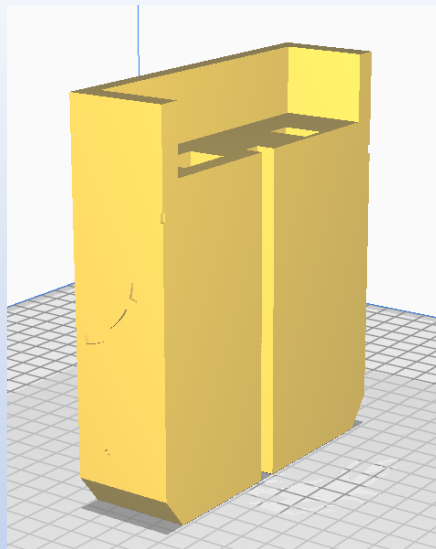
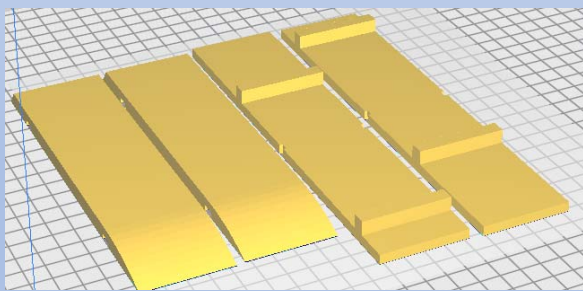
MrBaddeley prints in ABS (as he loves acetone welding) he has also printed in PETG, which is perfect for the dome as it does suffer from warping a little in ABS (this is a common problem with ABS). However (and it's a bid however) PETG is extremely hard to glue. Solvent welding can be used, but it is not recommended as it's nasty stuff, alternatively, Andrew Radovich recommends Gorilla Glue Gel and Baking Powder combination (it's been tested and its incredible stuff, but please test this before you commit to this form of gluing). If you are not in ABS, it is recommended that you use epoxy.

1.75mm filament peg holes were used throughout, so small holes which just fit the 1.75mm filament so that you can make alignment pegs. This is just for the front Ankle Curve, the rest of the leg uses Dovetail and peg fixing.

R2D2 LEGS

Print Orientation

For best results, print in these orientations

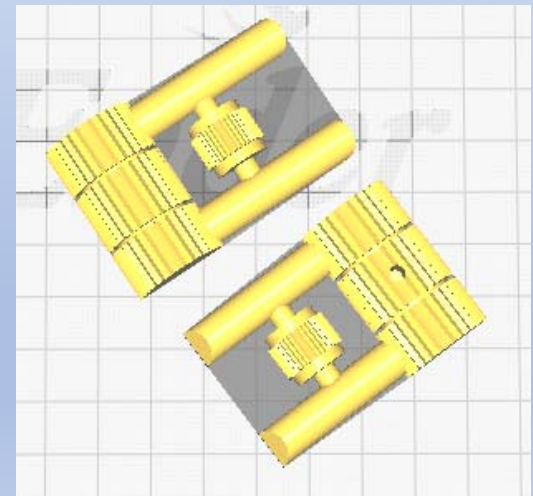
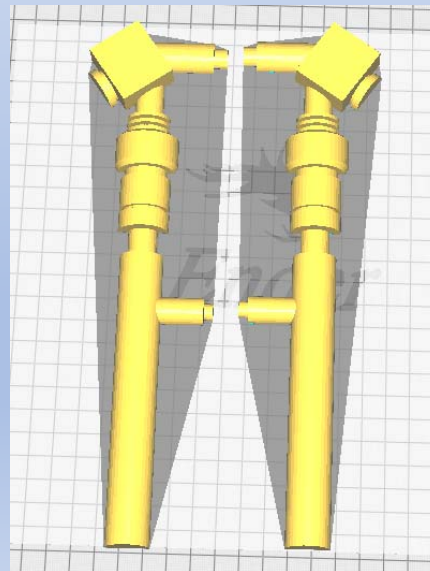
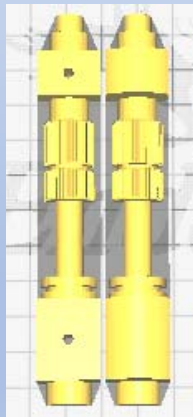
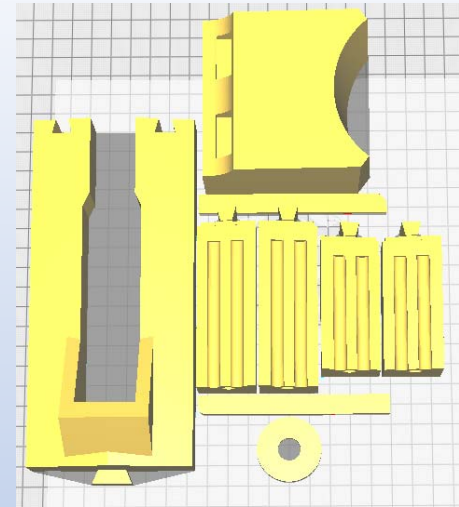
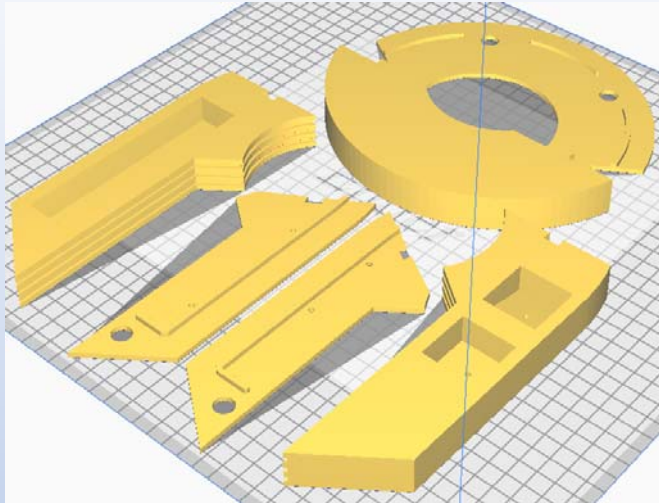
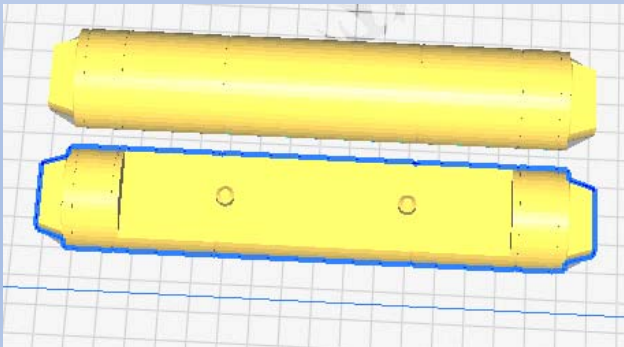


****When printing, supports are not required on most pieces****

R2D2 LEGS

Print Orientation

For best results, print in these orientations



****When printing, supports are not required on most pieces****

R2D2 LEGS

Main Assembly

(Both Left & Right Legs)

Note, there are two sets of ankle files, one for the 2-3-2 (Long) stance and one for the "Fixed" (standard) stance. You only need one of the two options.

Assembly is extremely easy (also fairly obvious)

The main body of the legs consists of the TopShoulder which fixes to the LowerShoulder with a dovetail joint (this can be Acetone welded or glued depending on the material used).

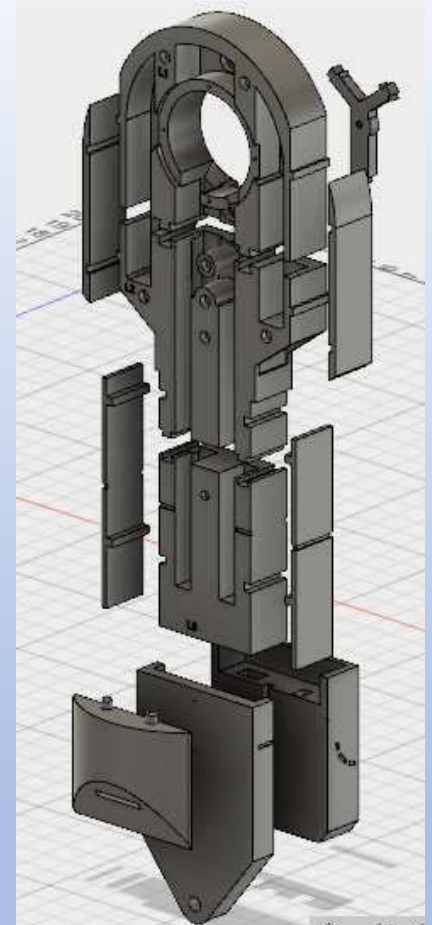
Then attached the LowerLeg, again with a Dovetail.

Then you have the upper plates on either side of the shoulder Part and lower plates on either side of the lower leg.

Finally, the CentreLeg piece slots in (this allows a 6mm Bearing to be fitted to ensure central fixing. Please note this doesn't take The weight of the droid alone, in the 2-3-2 setup, we use 100mm Lazy Susan bearings and in "fixed", the four holes are bolted on. The 6mm bearing is purely for alignment and a little extra support.

The Ankle is in three parts, with the outer curved bit aligned with Filament pegs, the hinge is fixed to the back section with a Slot / groove.

Do not glue the Ankle to the body of the leg at this stage, there are other parts to fit first.



****When printing, supports are not required on most pieces****

R2D2 LEGS

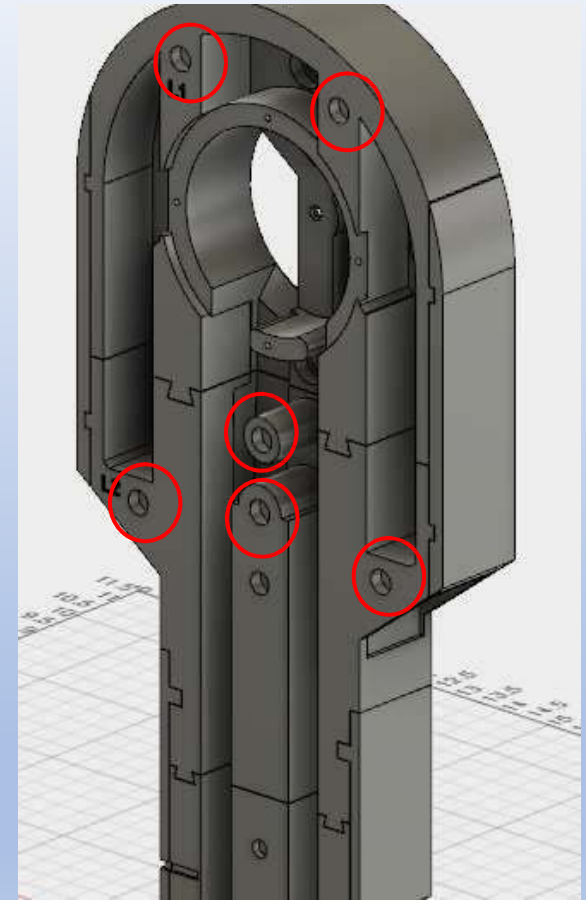
Main Assembly

(Both Left & Right Legs)

Spaces for Magnets (10mm x 5mm rare earth magnets) for the shoulder horseshoe & Booster Cover.

There are 6 magnets discs required and are fitted to The leg, it is recommended that two part epoxy adhesive to glue these in (they're strong little critters). You can fit these at any point but will need to make sure you get the poles correct for the shoulder horseshoe and booster covers.

Please make sure that you are using the same configuration on both legs, in doing so, you can then swap the horseshoe over from leg to leg to give the "Bolts front" or "Bolts rear" look. (As you may be aware, continuity across the films isn't great and R2 sports both looks...)



R2D2 LEGS

Horseshoe Assembly

(Both Left & Right Legs)

CSR:Spec

Note: Uses rare earth magnets (10mm x 5mm), these can be procured through amazon and ebay fairly cheaply.

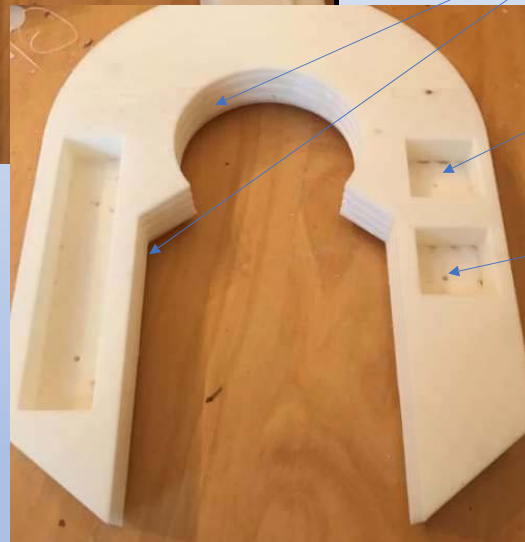
If you get the polarity right on both legs you can swap the Horseshoes back and forth for "Nuts front" or "Nuts back" look (R2 continuity has both and changes throughout).



Space for Magnets (10mm x 5mm rare earth magnets) to attach the Horseshoe to the leg.

Alignment posts to hold and fit to the V2 legs.

Full CSR spec detailing the inner face.



Accurate angle for the top Horseshoe "Nut" (Forgive the terminology if the correct one isn't known).

Holes for fixings

R2D2 LEGS

Horseshoe Assembly

(Both Left & Right Legs)

Assembly is extremely easy (and fairly obvious)

The Horseshoe is a simple 6 part design

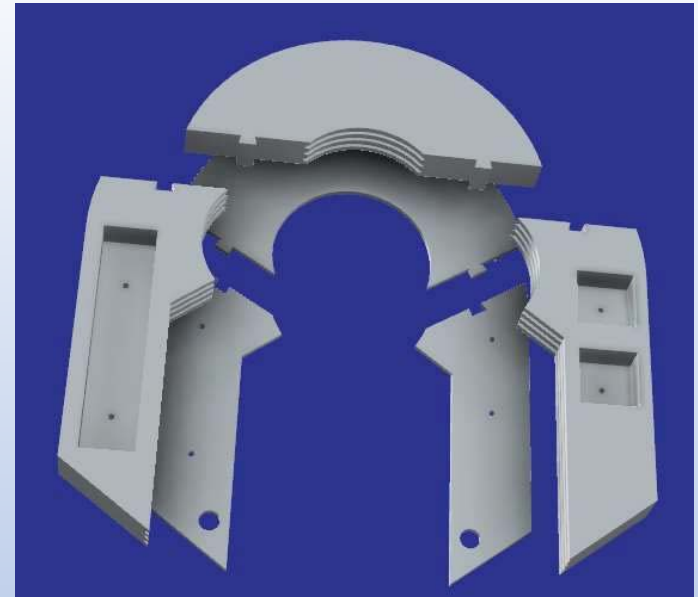
Glue together the main body using the dovetails. Glue the back plates on using a similar fashion. It does not matter which You assemble the back plates.

Alignment is completed by using the magnet holes (large holes) and the Greebles fixing holes (small holes).

Gluing the magnets it is recommended that you go for strength. The rare earth magnets are extremely strong so take care.

I would strongly recommend 2 part epoxy glue and level the magnets with the face of the frame, this can be done with a screwdriver to pull the magnet if it sinks into the epoxy.

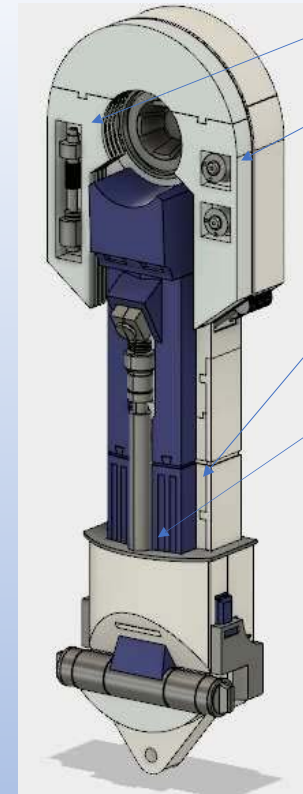
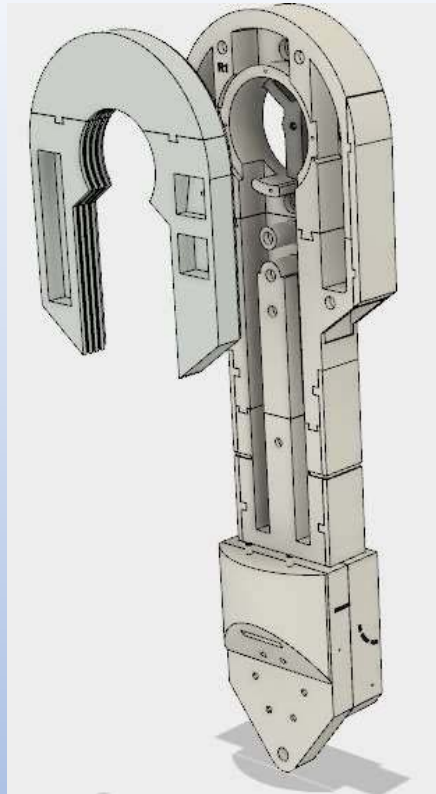
Finally, and most importantly, make sure the poles are right, a repelling horseshoe isn't a good thing and if you take care, you can get the same polarity on both legs so you can swap horseshoes.



R2D2 LEGS

Booster Assembly

(Both Left & Right Legs)



All parts CSR spec and accurate

Angle for shoulder nut in upper horseshore

Boosters have two optional sized end pieces for longer or STD leg (2-3-2 to stop the battery Box from hitting the skirt or shorter STD length)

Strut has two lengths

The Booster, hub and horseshoe are removable for access, part replacement and maintenance.

All parts are printed separately for easy painting and removal.

You should have already printed and assembled the Legs and Horseshoe.

****You should not have glued the Ankles to the Legs yet****

R2D2 LEGS

Booster Assembly

(Both Left & Right Legs)

The Booster assembly is easy and self explanatory. On the rear is marked Left and Right (there is a difference). Locating lips are on the rear and holes for magnets.



Each Booster is made up of 7 parts.

It is recommended 3 layers, 10% or 15% infill and 0.3 layer height for most of the build, however for the Booster I recommend 0.2 or 0.1 as there are flat angles with 15% infill. Easily printed at 0.3 but you'll have some finishing to do. Also, supports are useful on these parts, not a lot, but it makes a cleaner model.

Dovetails are the main fixing for the two parts (main body and plate). To stick them together there's alignment holes at the back, there are no filament holes as you can easily use the magnet holes to greeble holes for alignment.

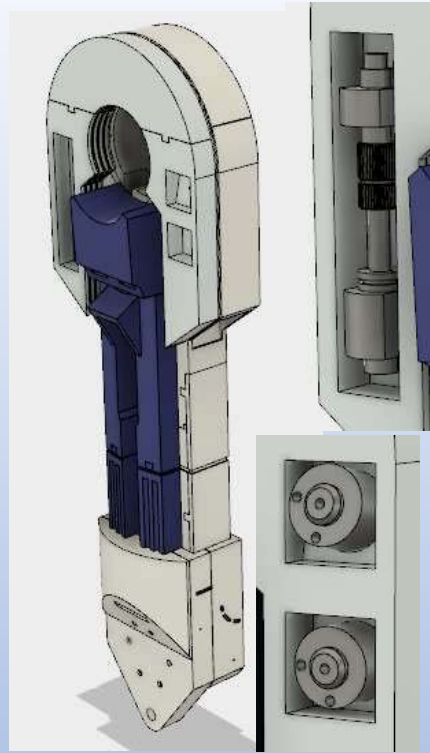
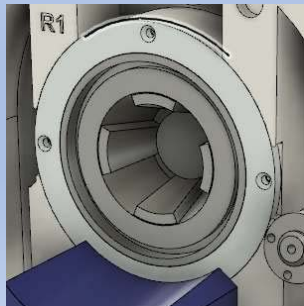
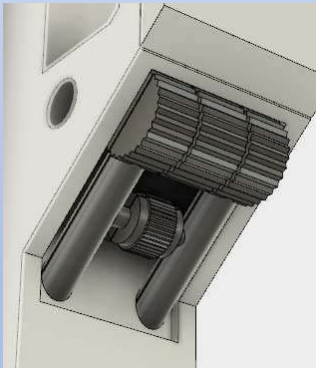
The Plates at the back are keyed, with a curved corner and an angled corner for orientation, you'll see these easily.

Two versions of the Boost Legs are given, STD and Long. These match the main leg options you choose.

R2D2 LEGS

Booster Assembly

(Both Left & Right Legs)



Shoulder nuts are simply printed (no support, 0.2 or 0.1 makes it easier to finish). Fittings are obvious and self tapping screws or glue can be used (or both).

The Shou_Hydr (Parts A & B) simply glue together it together to give you the Shoulder Hydraulics and again screw or glue it.

The Hub fits into the Hub Ring, which again screws to the leg. This will hold the foot locking bar later so it will need to be removable if you are going for the 2-3-2.

Leg stabilisers (or stabilizers if you're from the USA) are two parts, again glued and fixed with screws or glue. It is probably easier to use the hole to align and then glue this part in.

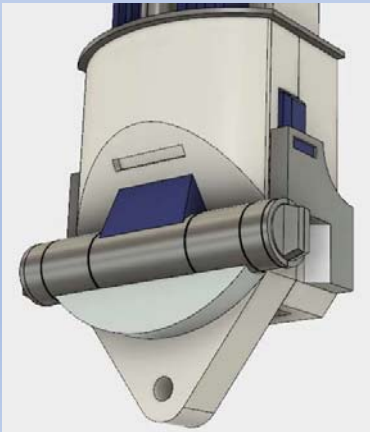
Obviously finish / paint everything before assembly and then fix them together.

This wraps it up for the shoulder / upper parts...

R2D2 LEGS

Leg, Strut & Ankle Bracelet

(Both Left & Right Legs)

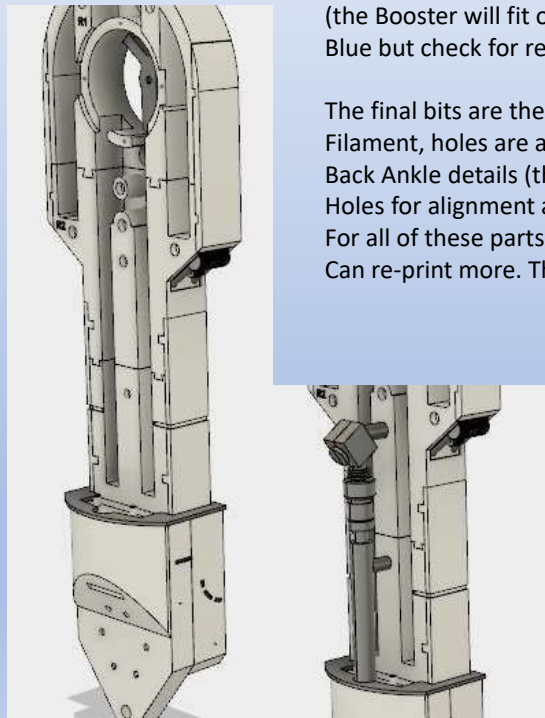


So the order and fixing of the build is important when we finally glue the Ankles onto the legs.

Firstly, print the Ankle Bracelet, finish and paint. This fits around the main Leg before the ankle is attached. You can either glue or fix the Bracelet to the Ankle and then glue the leg in (all parts finished and painted at this point) or leave the ankle loose on the leg, glue to the Ankle, then finally glue the Bracelet. This gives you the base Leg frame / model.

Next, print / glue the strut and finish. This can then be glued in place on the leg (the Booster will fit over and can be removed. The Leg behind the strut is typically painted Blue but check for references.).

The final bits are the lower leg greebles, the Cylinder (two parts, aligned with 1.75mm Filament, holes are already there), Wedge and Cylinder holder along with the front and Back Ankle details (these are also aligned with 1.75 filament). All parts having locating pins/ Holes for alignment and should be painted and glued on place. The use of 2 part epoxy glue For all of these parts just for strength. Although, if any damage or breakage happens, you Can re-print more. Thus the beauty of 3D printing...



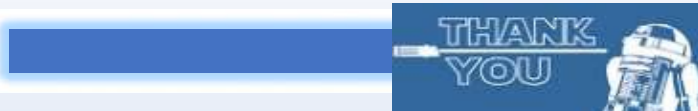
R2D2 LEGS

Leg, Strut & Ankle Bracelet

(Both Left & Right Legs)

And that's pretty much it for the legs...
All printed and assembled...





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