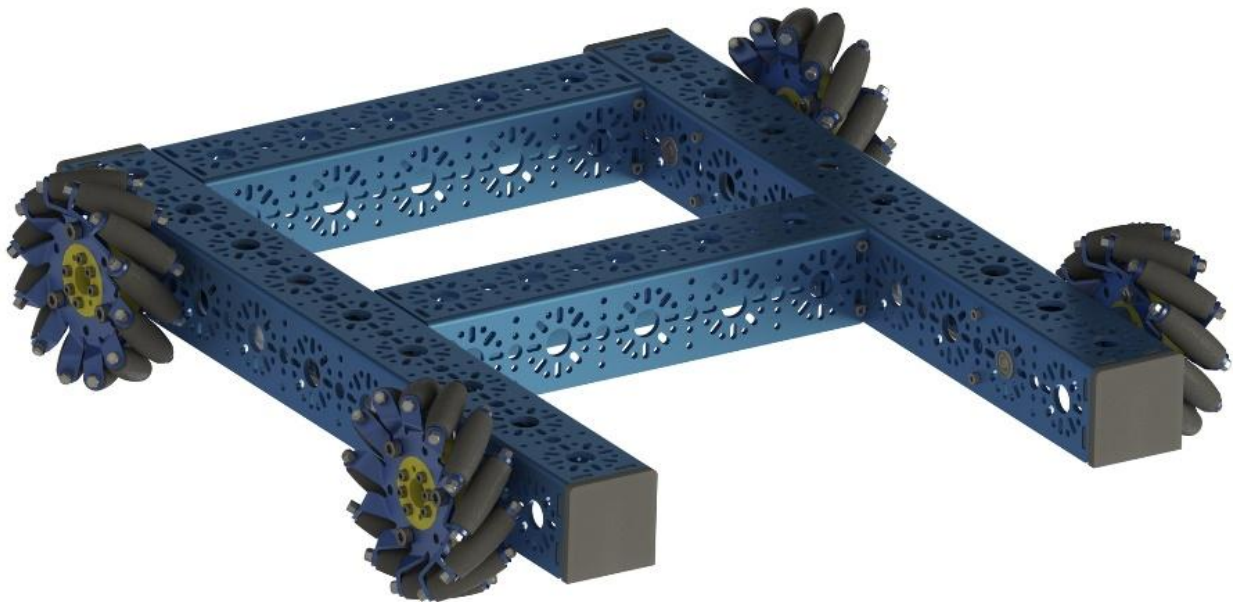




Assembly Instructions for
FTC Drivebase Kit - v2 (Hex)



Part #: 70400-v2



Introduction

The FTC Drive Base Kit – v2 from Studica Robotics includes all the parts needed to complete this Mecanum drivetrain build. This kit is available at <https://www.studica.com/studica-robotics/ftc-drive-base-kit-v2>

These build instructions will walk you through the steps of building your Mecanum Drivetrain. Also referred to as a Mecanum Chassis or Mecanum Drive Base. This is an example of what your completed project will look like.

Code to program the drivebase can be found here: <https://github.com/Studica-Robotics/FTC-Code>



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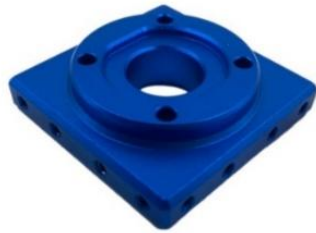


Parts List:

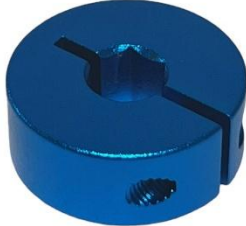
Name	Part #	Quantity	
Structure			
432mm U-Channel	76010	2	
240mm U-Channel	76014	2	
End Piece Plate (2 pack)	76143-2	2	

U-Channel Bumper (4 Pack)	76505-4	1	
Rubber Grommet (10 pack)	76504-10	1	
Motion			
NeveRest Orbital Gearmotor JST-VH-2	am-3637b	4	
NeveRest Motor REV Hub Encoder Cable	am-3926a	4	



Orbital Mount Plate	76138	4	
36 Tooth D-Shaft Helical Bevel Gear 1 to 1 Set	77224D	2	
36 Tooth Hex Helical Bevel Gear 1 to 1 Set	77224H	2	
6mm x 70mm Hex-Shaft (6-pack)	76160H-6	1	

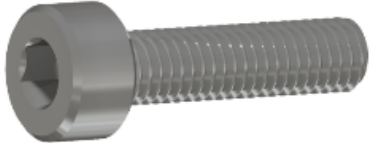


Clamping 6mm Hex-Shaft Hub	76281H	4	
6mm Hex-Shaft Flanged Bearing (12 pack)	76302H-12	1	
6mm Hex Shaft Collar Clamp	76320H	4	



100mm Slim Mecanum Wheel Set (Bearing Rollers, 2 left, 2 right)	76246	1	
Hardware & Tools			
2.5mm Hex Ball Screwdriver	70142	1	
M3 x 6mm Socket Head Cap Screw (50 pack)	76213-50	1	
M3 x 10mm Socket Head Cap Screw (100 pack)	76201-100	1	



M3 x 12mm Socket Head Cap Screw (100 pack)	76202-100	1	
M3 x 25mm Socket Head Cap Screw (50 pack)	76214-50	1	
6mm Hex-Shaft Nylon Spacer 1mm (24 pack)	76305H-24	1	
6mm Hex-Shaft Nylon Spacer 5mm (12 pack)	76307H-12	1	

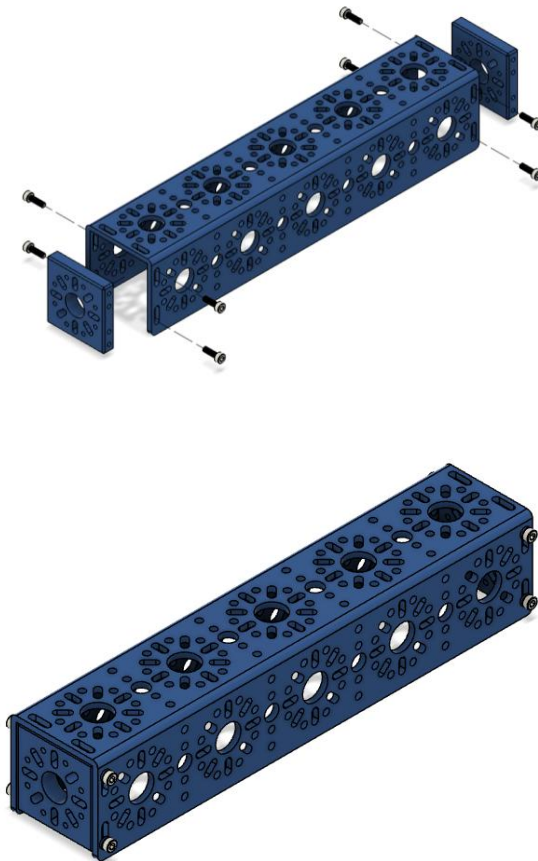


6mm D-Shaft Nylon Spacer 5mm (12 pack)	76307-12	1	
M3 Stainless Steel Split Washer (100 pack)	76216-100	1	

Step 1

Parts & Tools Required:

- 1 x 240mm U-Channel
- 2 x End Piece Plate
- 8 x M3 x 10mm Socket Head Cap Screws
- 2.5mm Hex Ball End Screwdriver

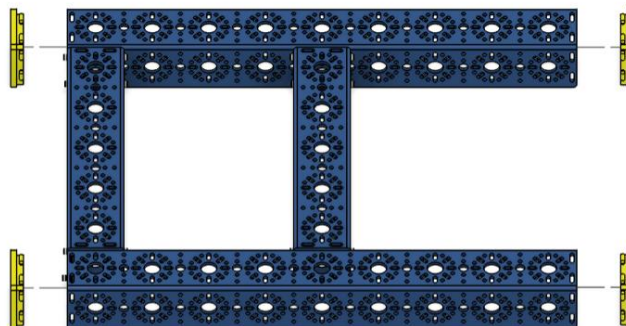
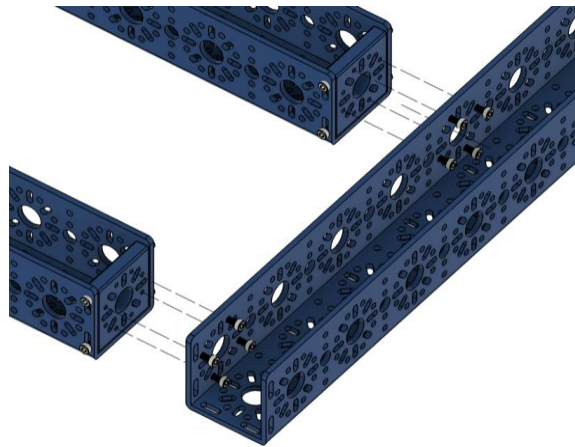


Screw the 2 End Piece Plates to each of the 240mm U-Channels using the M3 x 10mm SHCS. The End Piece Plate must be flush with ends of the 240mm U-Channel. Repeat this step with the other 240mm U-Channel.

Step 2

Parts & Tools Required:

- 2 x Step 1 Assembly
- 1 x 432mm U-Channel
- 8 x M3 x 12mm Socket Head Cap Screws
- 4 x U-Channel Bumpers
- 2.5mm Hex Ball End Screwdriver

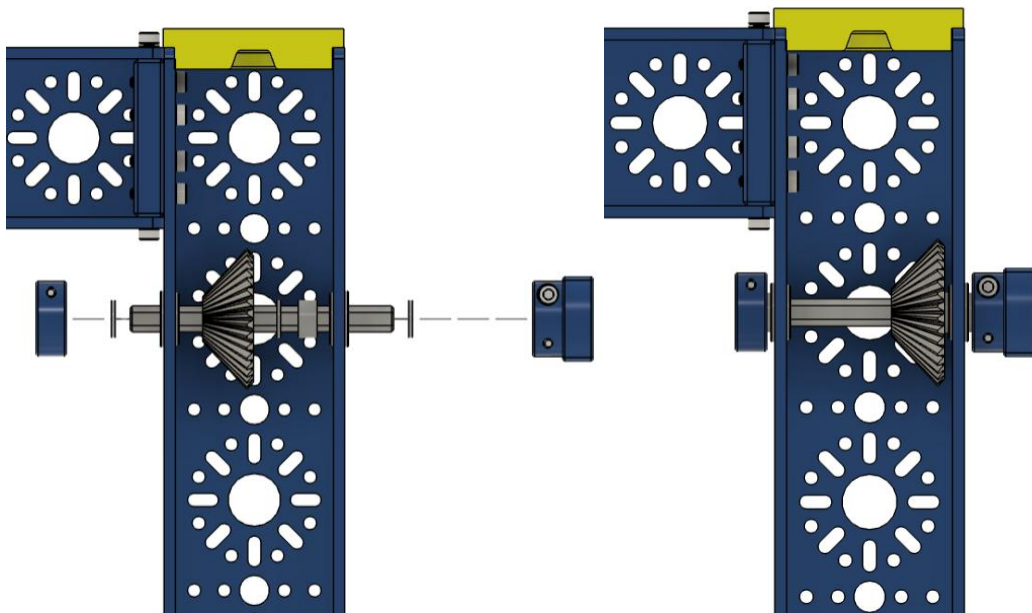


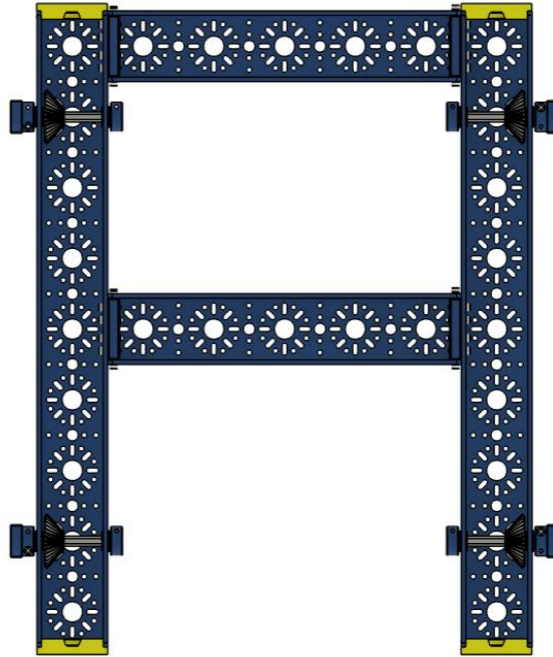
Screw the M3 x 12mm SHCS through the 432mm U-Channel into the tapped holes of the End Piece Plates from the assemblies from Step 1. Repeat for the other 432mm U-Channel.

Step 3

Parts & Tools Required:

- 1 x 6mm x 70mm Hex-Shaft
- 1 x Clamping 6mm Hex-Shaft Hub-v2
- 3 x 6mm Hex-Shaft Nylon Spacer 1mm
- 1 x 6mm Hex-Shaft Nylon Spacer 5mm
- 1 x 36 Tooth Hex-Shaft Helical Bevel Gear
- 1 x 6mm Hex Collar Clamp
- 2.5mm Hex Ball Screwdriver



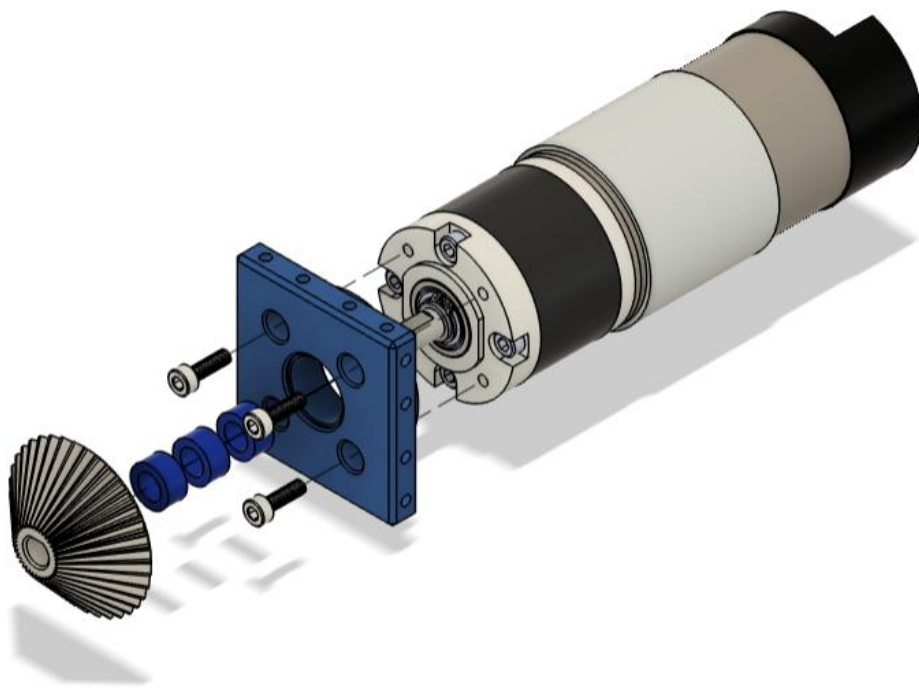


Start this assembly by attaching a Hex Collar Clamp to one end of a 6mm x 70mm Hex Shaft with the provided set screw so that the shaft is a few millimeters short of being flush with the clamp. Slide a 1mm spacer onto the shaft so that it is against the collar clamp. Load two hex bearings onto the 432mm U-Channel. Slide the shaft through the inner bearing. Once through the first bearing, slide the bevel gear, followed by the 1mm and 5mm shaft spacer onto the shaft. Then slide the shaft through the second bearing followed by a 1mm spacer onto the shaft so that it is against the second bearing. Then attach the clamping shaft hub to the shaft so that it is flat against the 1mm spacer and tighten with the given set screws. Repeat this step three times as shown above.

Step 4

Parts & Tools Required:

- 1 x Neverest Orbital Gearmotor
- 1 x Orbital Motor Mount
- 1 x Motor Encoder Cable
- 4 x M3 x 10mm Socket Head Cap Screws
- 3 x 6mm D-Shaft Nylon Spacer 5mm
- 1 36 Tooth D-Shaft Helical Bevel Gear
- 2.5mm Hex Ball End Screwdriver



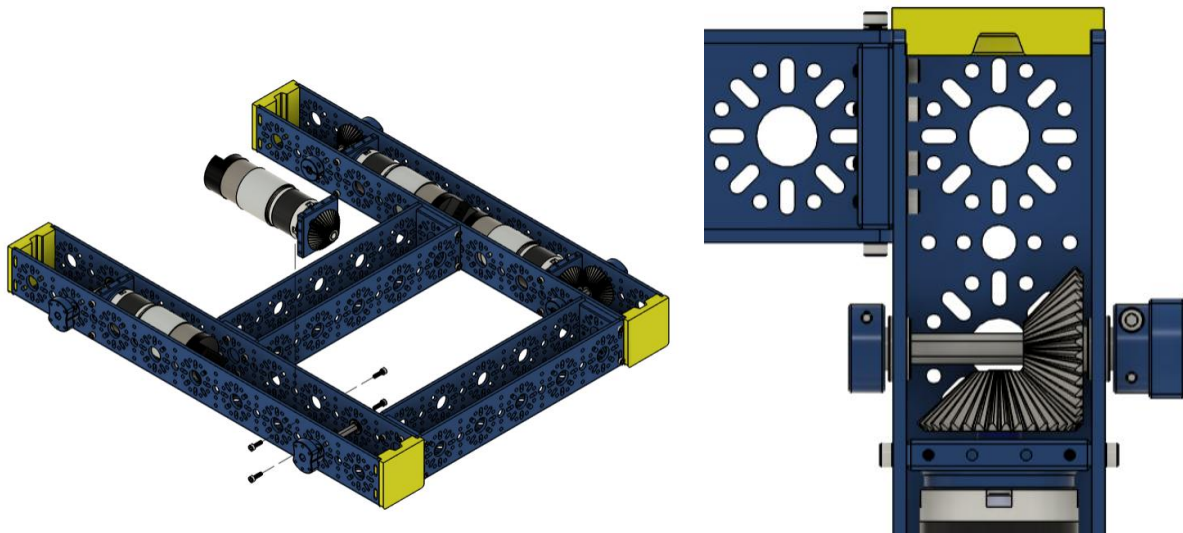
Attach the Encoder Cable to the end of the motor. Attach the Orbital Motor Mount Plate to the motor with the M3 x 10mm SHCS. Slide three 5mm Nylon Shaft Spacers onto the motor shaft with the 36 Tooth Helical Bevel Gear on top. Note the spacers and bevel gear will be loose.

Repeat this step for the other three motors.

Step 5

Parts & Tools Required:

- 1 x Assembly from Step 4
- 1 x M3 x 10mm SHCS
- 2.5mm Hex Ball Screwdriver



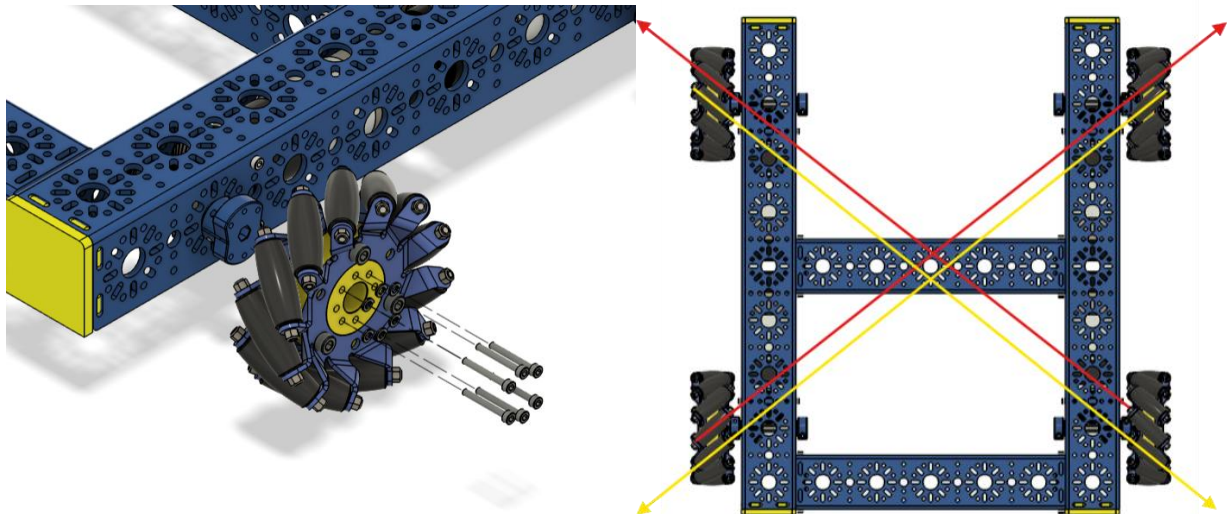
Attach the motor assembly from Step 8 to the drivebase frame as shown above. Make sure the bevel gears mesh well together then attach the assembly to the drivebase frame with four M3 x 10mm SHCS. Note: The encoder cap should be open and facing out to have access to the encoder cables.

Repeat this step for the other three motors.

Step 6

Parts & Tools Required:

- 1 x Slim Mecanum Wheel
- 6 x M3 x 25mm SHCS
- 6 x Stainless Steel Split Washer
- 2.5mm Hex Ball Screwdriver



Attach a Mecanum Wheel to the Hex Clamping Shaft Hub using 6 M3 x 25mm SHCS with M3 Stainless Steel Split Washers for each screw. Repeat this step for the other three Mecanum Wheels. NOTE: The mecanum wheels to be attached so that the rollers are in the correct orientation as shown above. The rollers of each wheel should look to be pointed diagonally away from the center of the drivebase frame.