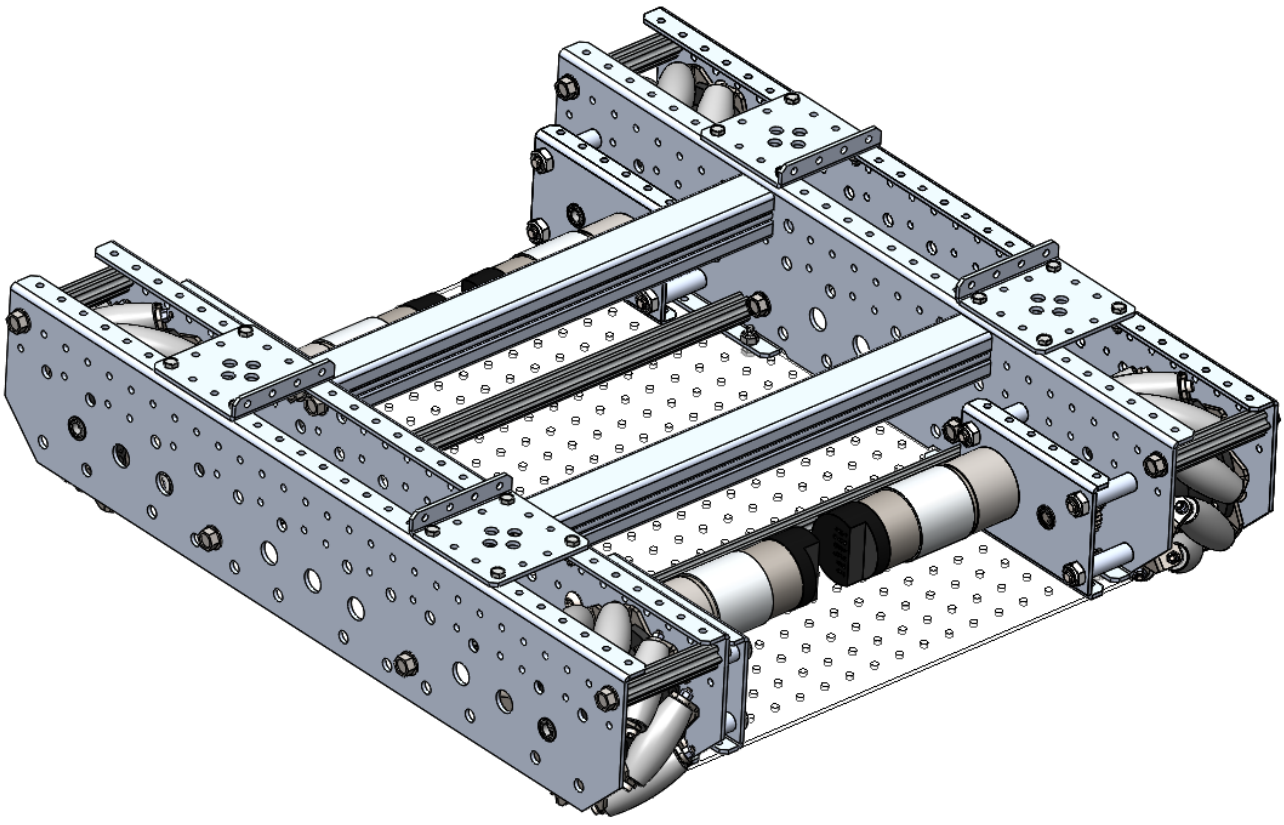
User Guide

TileRunner HD Mecanum (am-3437_HDmec)



Additional Instructions Available

We encourage customers to seek product information at **AndyMark.com**, contact us via e-mail at **support@andymark.com**, or call Toll-Free **877-868-4770** with questions about any of our products.

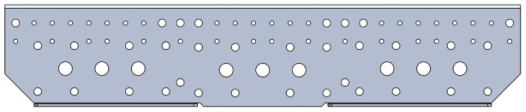
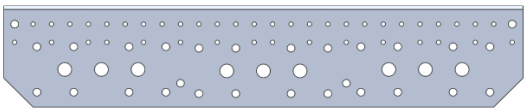
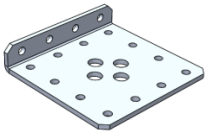
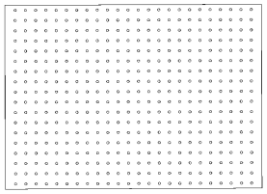
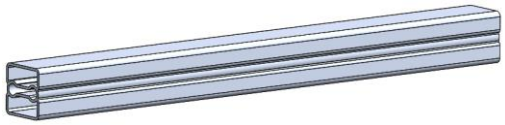
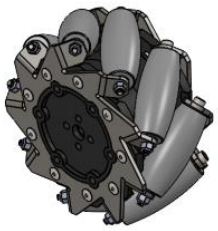
2019 Updates

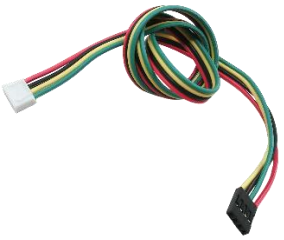
9-1-19: Updated instructions to match the new 6-32 Hex Head hardware. M3 NeveRest Mounting bolts are now 5mm long instead of 6mm. Added detail to help clarify build steps.

TileRunner Recommended Hand Tool List (not included)

Component	Part Number	QTY	Part Photo
3/32 in. Hex Driver	am-3173	1	
5/32 in. Hex Driver	am-2751	1	
5mm Allen Wrench	am-1180	1	
2.5mm Allen Wrench	am-1288	1	
5/16 in. Nut Driver	am-1273	1	
1/4 in. Nut Driver	am-3677	1	
3/8 in. Nut Driver	am-3877	1	
1/4 in. – 5/16 in. Open End Wrench	am-3174	2	
1/2 in. - 9/16 in. Open End Wrench	am-2746	1	
3/8 in. - 7/16 in. Open End Wrench	am-2745	1	

TileRunner Mecanum Bill of Materials

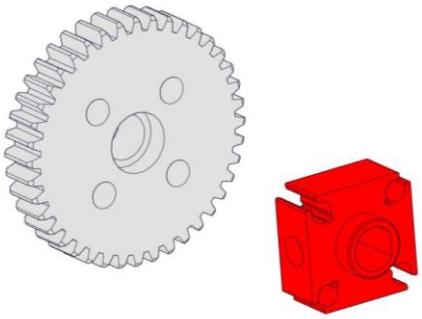
Component	Part Number	Quantity	Part Photo
am-3392_Inside	Chassis Inside Plate	2	
am-3392_Outside	Chassis Outside Plate	2	
am-3393	4x4 Plate	4	
am-3394	Belly Pan	1	
am-3395	Peanut, 11.25"	2	
am-3398	Churro, 11.25"	2	
am-3399	Churro, 63mm	8	
am-3919	4 in HD Mecanum, Wheel Set	1	

am-2964a	NeveRest 40 Gearmotor	4	
am-2992	Hall Effect Encoder Cable	4	
am-1443	Socket Head Cap Screw M3-0.5 x 5mm	24	
am-1310	Self Tapping Screw 1/4-20 x 0.75 in	28	
am-1436	Hex Head Machine Screw 6-32 x 0.5 in	64	
am-1419	Nut, Nylock, 6-32	32	
am-2768	Grease Packet	1	
am-3423	PicoBox Uno Plate	4	
am-3377	6x12x4 Flanged Bearing	14	
am-3407	40 Tooth Gear for PicoBox	8	

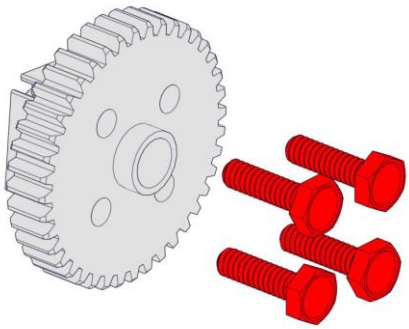
am-3408	35 Tooth Gear for PicoBox	4	
am-3409	45 Tooth Gear for PicoBox	4	
am-1102	Nut, Nylock Jam, 1/4-20	16	
am-1420	Screw, BHCS, 1/4-20 x 1 3/4"	16	
am-3226-100	6mm D Shaft, 100mm, plated	4	
am-3406	PicoBox Spacer	16	
am-3424	Spacer, aluminum, ¼ in. ID, 5/16 in. OD, 0.25 in. long	8	
am-3426	Spacer, aluminum, 12.7mm OD x 6.15mm ID x 9mm long	4	
am-3215a	6mm D Bore Double Boss Nub w/Set Screw	12	

PicoBox Gear Assembly Instructions

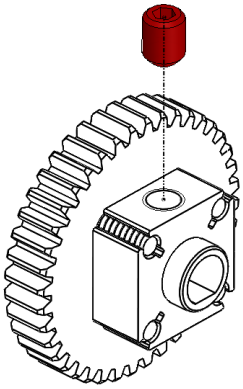
Step 1: Place a 6mm D-Bore Double Boss Nub (am-3413a) into the center hole of a 40 Tooth Gear for PicoBox (am-3407) and align the bolt circles of the Nub and the Gear.



Step 2: Flip the gear over and secure the Nub to the gear by threading four 6-32 x 0.5 in Hex Head Screws (am-1436) into the Nub.



Step 3: Ensure that a #10-32 Set Screw is partially threaded into the Nub.



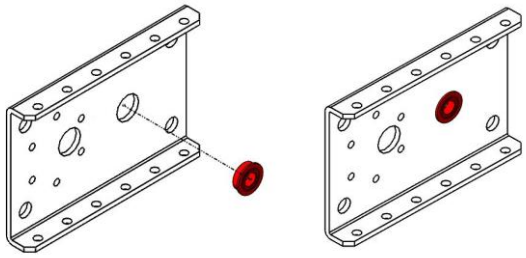
NOTE: These instructions provide steps to create a PicoBox Uno that utilizes a 1:1 gear ratio between the NeveRest motors and the PicoBox Output shaft. To utilize the other included 1.28:1 or 1:0.78 ratios, follow these steps with the included 35 Tooth and 45 Tooth gears.

Repeat 7 more times to make 8 total PicoBox Gear Assemblies.

8X

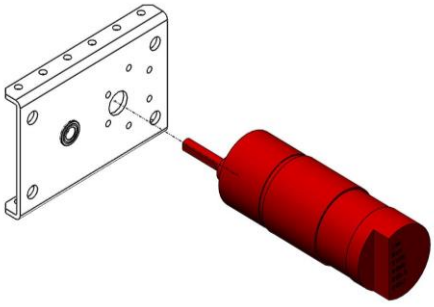
PicoBox Uno Assembly Instructions

Step 1: Press a 6x12x4 Flanged Bearing (am-3377) into the center 12mm hole of a PicoBox Uno gearbox plate (am-3423).

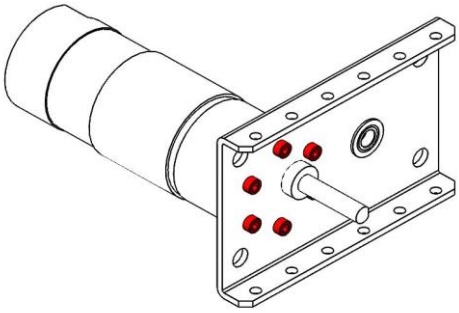


NOTE: Make sure the flange of the bearing is on the same side of the plate as the flanges, and is flush against the sheet metal of the gearbox plate.

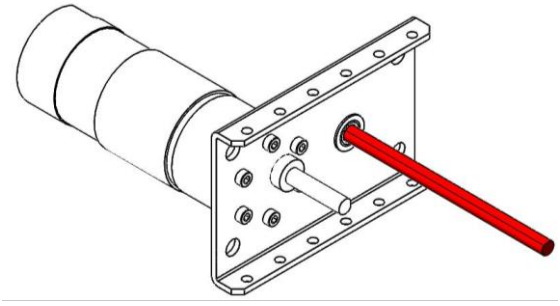
Step 2: Insert a NeveRest motor into the remaining 12mm hole of the PicoBox Uno gearbox plate, opposite of the flanges on the gearbox, and line up the threaded holes on the end of the motor with the bolt-circle holes of the gearbox plate.



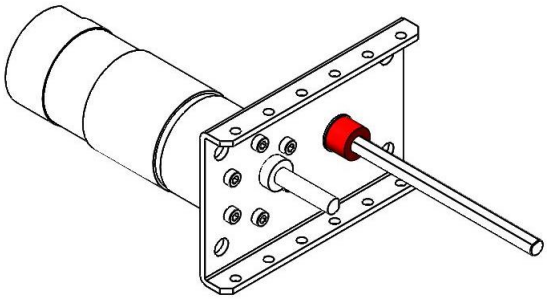
Step 3: Install six M3-0.5 x 5mm long socket head screws (am-1443) to secure the NeveRest motor to the gearbox plate.



Step 4: Install the 6mm D-Shaft (am-3226-100) into the center bearing such that the end of the shaft is flush with the end of the bearing.

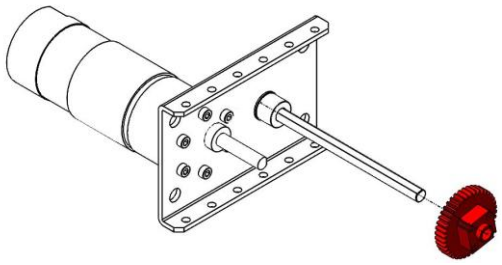


Step 5: Install the 9mm long Aluminum Spacer (am-3426) on the center axle up against the previously installed bearing.

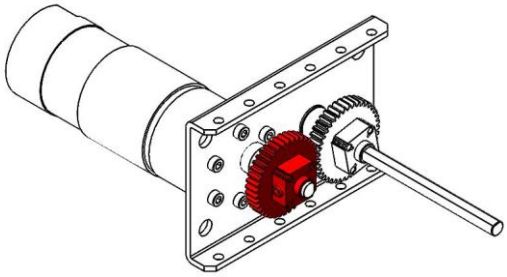


PicoBox Uno Assembly Instructions

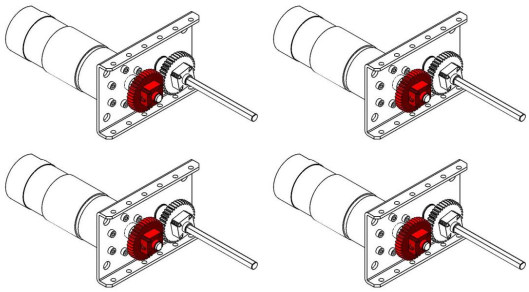
Step 6: Install one Gear Assembly onto the center axle of the gearbox. Be sure to place the boss of the Gear against the spacer. Tighten the #10-32 set screw to lock the Gear Assembly in place.



Step 7: Install a Gear Assembly onto the NeveRest Motor shaft such that is lined up with the Gear Assembly installed on the center axle. Tighten the #10-32 set screw to lock the Gear Assembly in place

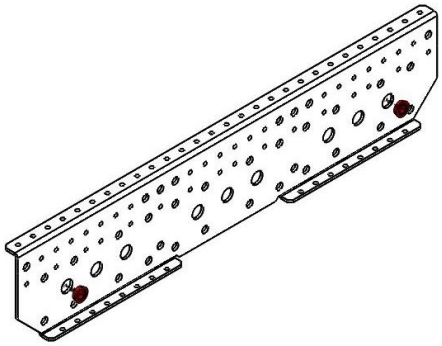


Step 8: Repeat 3 more times to make 4 total PicoBox Unos for the drive train.

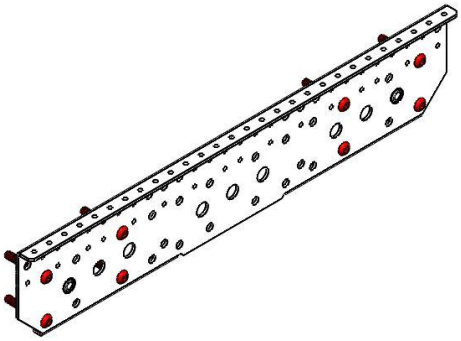


TileRunner Mecanum Chassis (am-3437_HDmec) Assembly Instructions

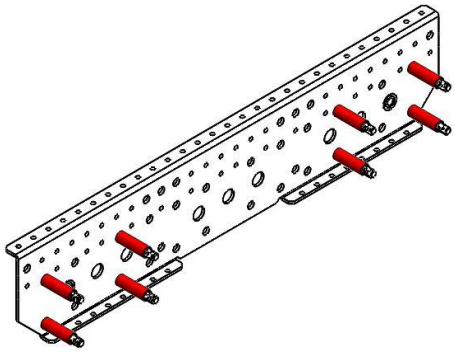
Step 1: Press two 6x12x4 Flanged Bearings (am-3377) into the outermost 12mm holes of the TileRunner Inside Plate (am-3392_Inside). Make sure the flanges of the bearings are flush against the side of the plate with two flanges



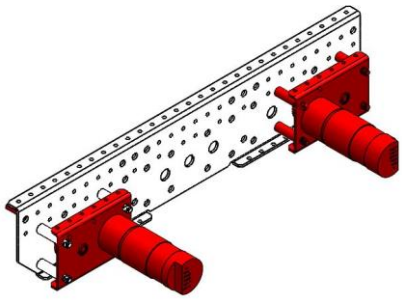
Step 2: Insert eight 1/4-20 x 1.75" Button Head Screws (am-1420) into the Inside Plate at the indicated locations. Make sure the head of the screws are on the side of the Inside Plate with a single solid flange.



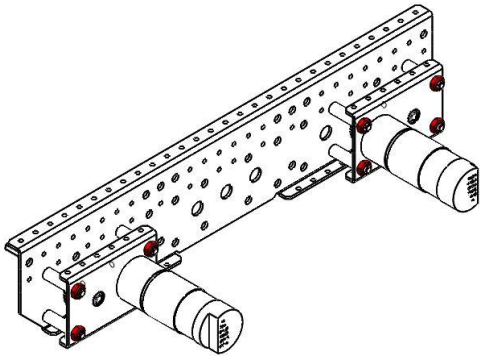
Step 3: Place a PicoBox Spacer (am-3406) over each of the 1/4-20 screws on the side of the Inside Plate with two flanges.



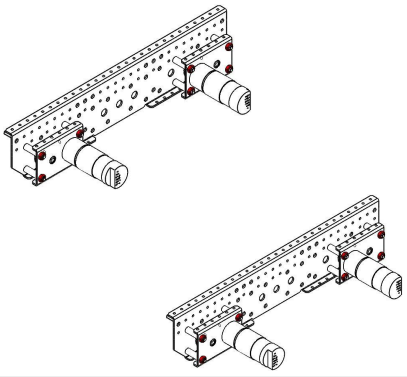
Step 4: Insert the Center Axles of two Gearbox Assemblies into the bearings on the TileRunner Inside Plate. Align the four 1/4-20 screws with the four ¼ in holes on each of the PicoBox Uno Plates, and push the assemblies together.



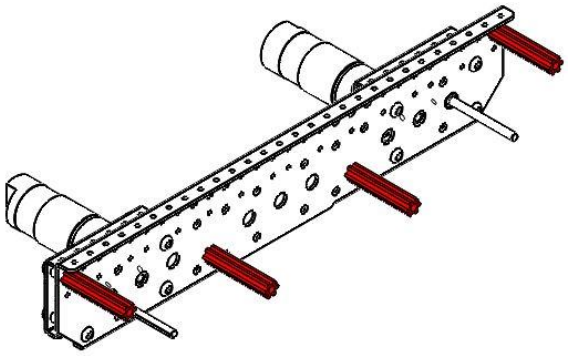
Step 5: : Secure the Gearbox Assemblies with 1/4-20 Nylock Jam Nuts (am-1102).



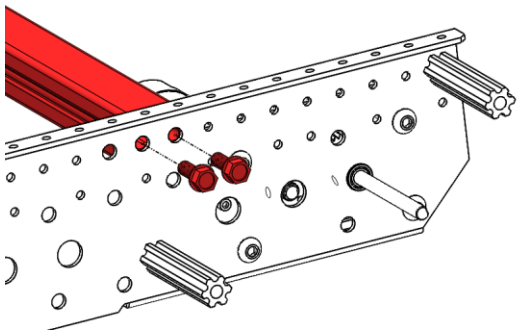
Step 6: Repeat Steps 1-5 to create two completed Inside Plates.



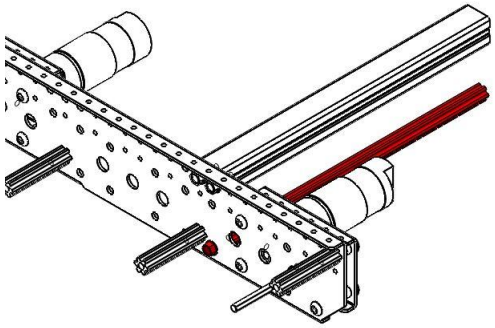
Step 7: Attach four 63mm Churro (am-3399) to one of the Inside Plates using 1/4-20 x 0.75 in Self Tapping Screws (am-1310).



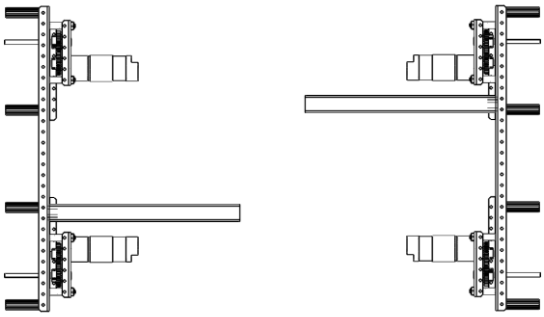
Step 8: Attach one 11.25” Peanut (am-3395) to one of the sub-assemblies on the same side of the plate as the PicoBox Unos using two 1/4-20 x 0.75 in Self Tapping Screws (am-1310).



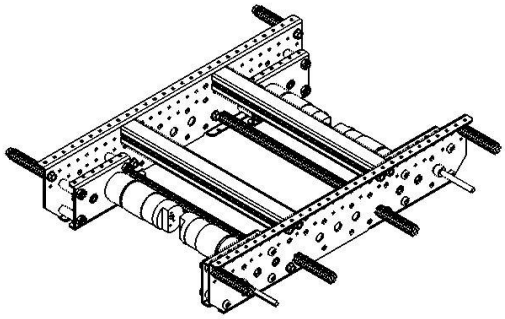
Step 9: Attach one 11.25” Churro Extrusion (am-3398) to the same sub-assembly on the same side of the plate as the PicoBox Unos using one 1/4-20 x 0.75 in Self Tapping Screw (am-1310).



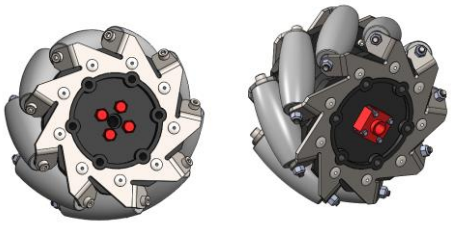
Step 10: Repeat steps 1-9 on the other Inside Plate assembly. These should be identical, so that they can be rotated into their final orientation on the robot.



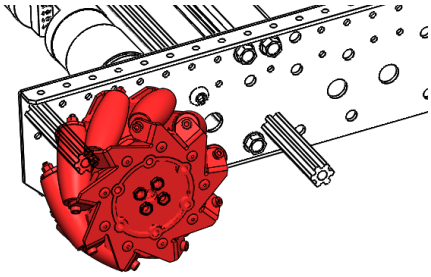
Step 11: Join the two sub-assemblies together with six 1/4-20 x 0.75 in Self Tapping Screws (am-1310).



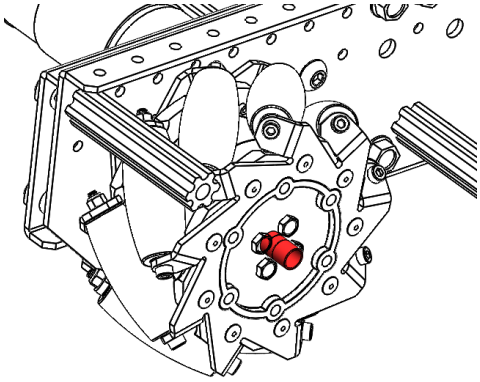
Step 12: On each of the 4 Mecanum wheels, secure a 6mm D Bore Double Boss Nub (am-3215a) with four 6-32 x 2.0 in Hex Head Cap Screws (am-1499)



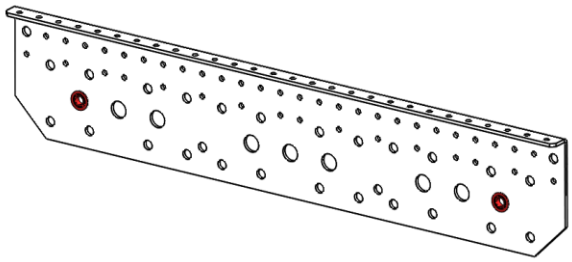
Step 13: Slide a wheel onto each of the 6mm gearbox axles, nub side first. When the wheel is up against the spacers, tighten the set screw in the Nub. Remember the rollers should form an 'X' when viewed from above.



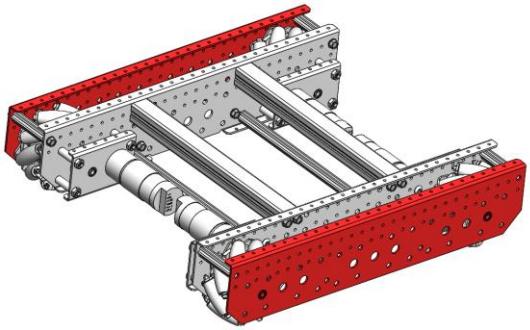
Step 14: Install two 0.25 in long aluminum spacers (am-3424) on to each of the 6mm axles on the outside of the Mecanum Wheel.



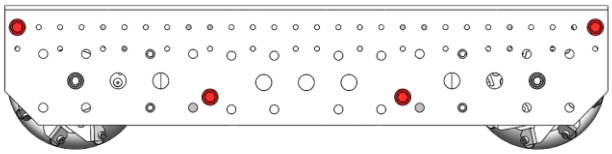
Step 15: Press two 6x12x4 Flanged Bearings (am-3377) into the outermost 12mm holes of the TileRunner Outside Plate (am-3392_Outside). Make sure the flange of the bearings are flush against the side of the plate with a single solid flange. Repeat for a total of two Outside Plates.



Step 16: Slide the 6mm gearbox axles into the bearings installed in the Outside Plates and make sure the flanges of the Outside Plates point towards the inside of the chassis.

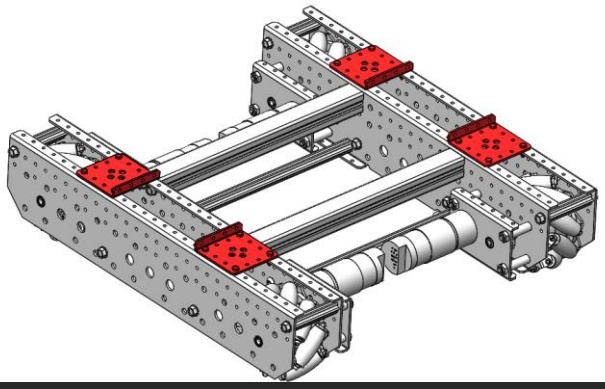


Step 17: Secure the Outside Plates to the chassis by threading four 1/4-20 x 0.75 in Self Tapping Screws (am-1310) on both sides into the four 63mm Churro Extrusions installed in Step 7.



TileRunner Mecanum Chassis (am-3437_HDmec) Assembly Instructions

Step 18: Add the 4x4 Brackets (am-3393) to the top of the drive modules. Secure each bracket with four 6-32 x 0.5 in Hex Head Screws (am-1436) and 6-32 Nylock Nuts (am-1419).



NOTE: These can be placed anywhere along the module to help add strength and provide mounting options for additional systems

Step 19: Bolt the Belly Pan (am-3394) to the Inside Plates of the chassis using 6-32 x 0.5 in Hex Head Screws (am-1436) and 6-32 Nylock Nuts (am-1419).