

Popular Variants:

TileRiser HD Mecanum (BTRMH2E)

TileRiser Omni & 60A Stealth Wheels (BTRO64E)

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.

2021 Updates

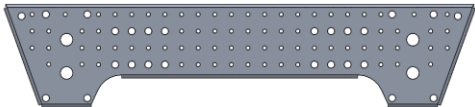
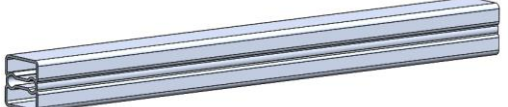



9-18-21: Release of New TileRiser Chassis

10-22-21: Updated parts list and instructions related to SD Mecanum Wheels.




TileRiser 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	
2.5mm Allen Wrench	am-1288	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	
5/8 in. Open End Wrench, or 16mm Open End Wrench, or Adjustable Pliers	n/a	1	


TileRiser Frame Bill of Materials

Part Number	Component	Quantity	Part Photo
am-4614	TileRiser Plate	4	
am-3395	11.25" Peanut	2	
am-3399	63mm Churro	8	
am-1443	M3-0.5 x 5mm Socket Head Cape Screw	24	
am-1310	1/4-20 x 0.75 in. Self Tapping Hex Washer Head Screw	28	

TileRunner Common Drive Bill of Materials

Part Number	Component	Quantity	Part Photo
am-1102	¼-20 Nylock Jam Nut	8	
am-1420	¼-20 x 1.75 in. Button Head Cap Screw	8	
am-1563	6-32 x 0.50 in. Hex Head Screw with Thread Lock	32	
am-3215a	6mm D Bore Double Boss Nub w/Set Screw	8	
am-3226-100	6mm D Shaft, 100mm	2	
am-3377	6x12x4 Flanged Bearing	14	

TileRunner 4WD Bill of Materials

Part Number	Component	Quantity	Part Photo
am-1102	¼-20 Nylock Jam Nut	8	
am-1420	¼-20 x 1.75 in. Button Head Cap Screw	8	
am-3215a	6mm D Bore Double Boss Nub w/Set Screw	4	
am-3226-100	6mm D Shaft, 100mm	2	
am-3424	0.25 in ID 0.312 in. OD x 0.25 in. Long Aluminum Spacer	8	






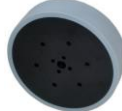





TileRiser Mecanum Wheel Options

Code	Part Number	Component	Quantity	Part Photo
MS	am-2538	4 in. Mecanum Wheel Single Wheel Kit	4	
	am-1595	7mm Aluminum Spacer	4	
	am-1437	6-32 x 1.25" Hex Head Machine Screw	16	
MH	am-3919L	4 in HD Mecanum, Left	2	
	am-3919R	4 in HD Mecanum, Right	2	
	am-1569	6-32 x 2" Hex Head Cap Screw	16	

TileRiser Omni & Stealth Wheel Options

Code	Part Number	Component	Quantity	Part Photo
O4	am-2648_Orange	4" Stealth Wheel 8mm Bore Orange 40 Durometer	2	
	am-2948a	4" Aluminum Omni Wheel with 8mm Bore	2	
	am-1513	0.375 in. OD x 0.257in. ID x 0.875 in. Long Spacer	2	
	am-3424	0.25 in. ID x 0.312 in. OD x 0.25 in Long Aluminum Spacer	14	
	am-1564	6-32 x 3/4" Hex Head Machine Screw	8	
	am-1566	6-32 x 1.25" Hex Head Machine Screw	8	
O5	am-2648_Blue	4" Stealth Wheel 8mm Bore Blue 50 Durometer	2	
	am-2948a	4" Aluminum Omni Wheel with 8mm Bore	2	
	am-1513	0.375 in. OD x 0.257in. ID x 0.875 in. Long Spacer	2	
	am-3424	0.25 in. ID x 0.312 in. OD x 0.25 in Long Aluminum Spacer	14	
	am-1564	6-32 x 3/4" Hex Head Machine Screw	8	
	am-1566	6-32 x 1.25" Hex Head Machine Screw	8	







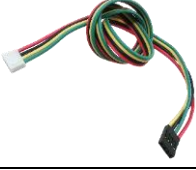



TileRiser Omni & Stealth Wheel Options

Code	Part Number	Component	Quantity	Part Photo
O6	am-2648_Blak	4" Stealth Wheel 8mm Bore Black 60 Durometer	2	
	am-2948a	4" Aluminum Omni Wheel with 8mm Bore	2	
	am-1513	0.375 in. OD x 0.257in. ID x 0.875 in. Long Spacer	2	
	am-3424	0.25 in. ID x 0.312 in. OD x 0.25 in Long Aluminum Spacer	14	
	am-1564	6-32 x 3/4" Hex Head Machine Screw	8	
	am-1566	6-32 x 1.25" Hex Head Machine Screw	8	
O8	am-2648	4" Stealth Wheel 8mm Bore Gray 80 Durometer	2	
	am-2948a	4" Aluminum Omni Wheel with 8mm Bore	2	
	am-1513	0.375 in. OD x 0.257in. ID x 0.875 in. Long Spacer	2	
	am-3424	0.25 in. ID x 0.312 in. OD x 0.25 in Long Aluminum Spacer	14	
	am-1564	6-32 x 3/4" Hex Head Machine Screw	8	
	am-1566	6-32 x 1.25" Hex Head Machine Screw	8	


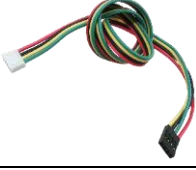








TileRiser Omni & Performance Wheel Options

Code	Part Number	Component	Quantity	Part Photo
OP	am-3612	4" Performance Wheel, Nub Mount with Screw	2	
	am-2611a	Gray Grippy Tread 1 in. Wide, 10 ft. Long	1	
	am-2948a	4" Aluminum Omni Wheel with 8mm Bore	2	
	am-1513	0.375 in. OD x 0.257 in. ID x 0.875 in. Long Spacer	4	
	am-3424	0.25 in. ID x 0.312 in. OD x 0.25 in Long Aluminum Spacer	10	
	am-1564	6-32 x 3/4" Hex Head Machine Screw	8	
	am-1566	6-32 x 1.25" Hex Head Machine Screw	8	











TileRiser NeveRest and PicoBox Plate Options

Code	Part Number	Component	Quantity	Part Photo
6	am-3103b	NeveRest Classic 60 Gearmotor w/ JST Connector	4	
	am-2992	Hall Effect Encoder Cable with 4-pin Connector	4	
	am-3406	PicoBox Spacer	16	
	am-3426	0.242 in. ID x 0.50 in. OD x 0.354 in. Long Aluminum Spacer	2	
	am-3423	PicoBox Uno Plate	4	
4	am-2964b	NeveRest Classic 40 Gearmotor w/ JST Connector	4	
	am-2992	Hall Effect Encoder Cable with 4-pin Connector	4	
	am-3406	PicoBox Spacer	16	
	am-3426	0.242 in. ID x 0.50 in. OD x 0.354 in. Long Aluminum Spacer	2	
	am-3423	PicoBox Uno Plate	4	








TileRiser NeveRest and PicoBox Plate Options

Code	Part Number	Component	Quantity	Part Photo
2	am-3637b	NeveRest Orbital 20 Gearmotor w/ JST Connector	4	
	am-2992	Hall Effect Encoder Cable with 4-pin Connector	4	
	am-3406	PicoBox Spacer	16	
	am-3426	0.242 in. ID x 0.50 in. OD x 0.354 in. Long Aluminum Spacer	2	
	am-3475	PicoBox MEO Plate	4	
1	am-4610b	NeveRest Orbital 14 Gearmotor w/ JST Connector	4	
	am-2992	Hall Effect Encoder Cable with 4-pin Connector	4	
	am-3406	PicoBox Spacer	16	
	am-3426	0.242 in. ID x 0.50 in. OD x 0.354 in. Long Aluminum Spacer	2	
	am-3475	PicoBox MEO Plate	4	







TileRiser NeveRest and PicoBox Plate Options

Code	Part Number	Component	Quantity	Part Photo
N	n/a	No Motors or Plates provide your own)	0	
P	am-3475	PicoBox MEO Plate	4	
	am-3423	PicoBox Uno Plate	4	
	am-3406	PicoBox Spacer	16	
	am-3426	0.242 in. ID x 0.50 in. OD x 0.354 in. Long Aluminum Spacer	8	
C	am-3423	PicoBox Uno Plate	4	
	am-3406	PicoBox Spacer	16	
	am-3426	0.242 in. ID x 0.50 in. OD x 0.354 in. Long Aluminum Spacer	8	
O	am-3475	PicoBox MEO Plate	4	
	am-3406	PicoBox Spacer	16	
	am-3426	0.242 in. ID x 0.50 in. OD x 0.354 in. Long Aluminum Spacer	8	

TileRiser Gear Options

Code	Part Number	Component	Quantity	Part Photo
1	am-3407	40 Tooth PicoBox Gear	8	
A	am-3408	35 Tooth PicoBox Gear	4	
	am-3409	45 Tooth PicoBox Gear	4	
E	am-3407	40 Tooth PicoBox Gear	8	
	am-3408	35 Tooth PicoBox Gear	4	
	am-3409	45 Tooth PicoBox	4	
N	n/a	No Gears (provide your own)	0	

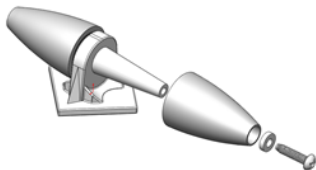
4 in. Standard Mecanum Wheel Bill of Materials

Part Number	Component	Quantity	Part Photo
am-2540_half	4 in Mecanum Wheel Body Half	8	
am-2541	4 in Mecanum Wheel Roller	48	
am-2610	4 in Mecanum Wheel Spindle	24	
am-1328	0.115 in. ID x 0.25 in. OD x 0.062 in. Thick Nylon Washer	48	
am-1317	Phillips Pan Head 4-40 x 0.5 in Self-Tapping Screw	48	
am-1247	Phillips Pan Head 4-40 x 1.0 in Self-Tapping Screw	24	

Standard Mecanum Wheel Assembly Instructions

NOTE: The following assembly instructions only apply if you have selected the Standard Mecanum wheel (MS) option.

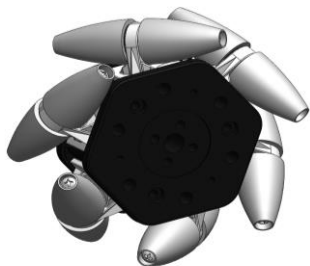
Step 1: Place a Roller (am-2541) onto the arm of the Spindle (am-2610), add a 0.25" Nylon Washer (am-1328) and secure with a 4-40 x 0.5" Pan Head Phillips Thread Forming Screw (am-1317).



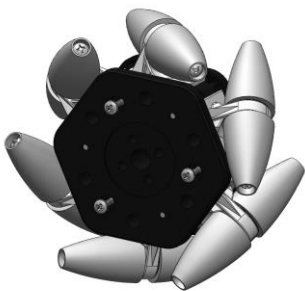
6X

NOTE: Be sure to tighten the screw until the roller can no longer wiggle along the axle but rolls freely

Step 3: Take another 4" Mecanum Wheel Body Half (am-2540_half) and press it into the bases of the spindles. The large clearance holes will line up with the smaller holes.



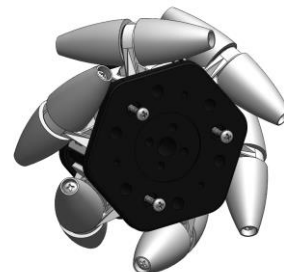
Step 5: Flip the wheel over and secure with three more 4-40 x 1" Pan Head Phillips Thread Forming Screws (am-1247).



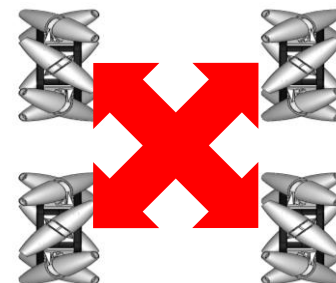
Step 2: With the assembled spindles, place into slots on one 4" Mecanum Wheel Body Half (am-2540_half).



Step 4: Secure the two Wheel Body halves together with three 4-40 x 1" Pan Head Phillips Thread Forming Screws (am-1247).

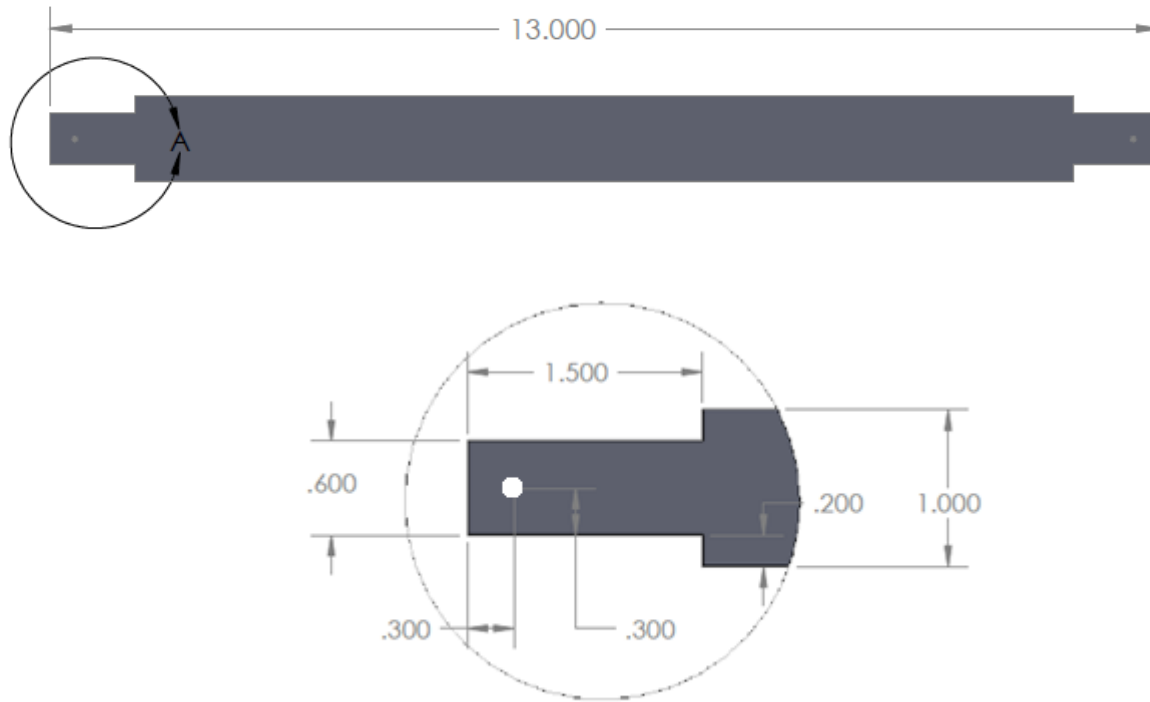


Step 6: Assemble 3 more Mecanum Wheels. One should be the same and two should be opposite to create two right and two left handed wheels. When looking at the robot from the top, the top most rollers should form an "X".



Performance Wheel Assembly Instructions

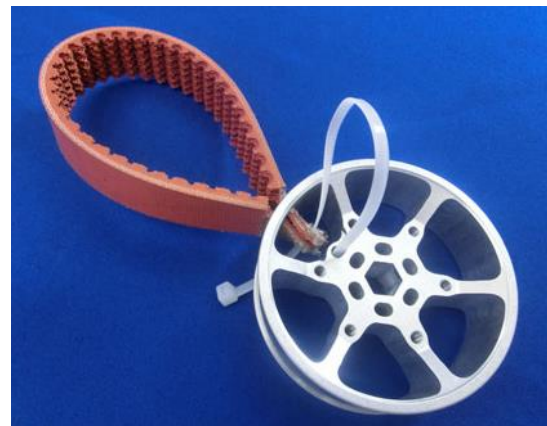
Step 1: Cut tread to a length long enough to wrap around the wheel with a 1" overlap. Narrow each end of the tread approximately 0.200" on each side, leaving a tab between 1/2" to 5/8" wide centered on the tread. These tabs will fit through the slot and into the center of the wheel. To make assembly easier, it is also useful to sand down the tread on the narrowed ends. Make one hole on each end centered at minimum 0.25" away from the end of the tread to allow a ziptie to pass through.



Step 2: Put both ends of the tread together with the rubber sides facing each other. Place a strong ziptie (am-1189 recommended) through the holes in the tread. Do not connect and close the ziptie yet!



Step 3: Thread the ziptie and the ends of the tread through the slot on the performance wheel.



Performance Wheel Assembly Instructions

Step 4: Flip the tread so the rubber side is facing outwards and wrap around wheel.



Step 5: Secure zip tie to the anchor point between the wheel spokes.

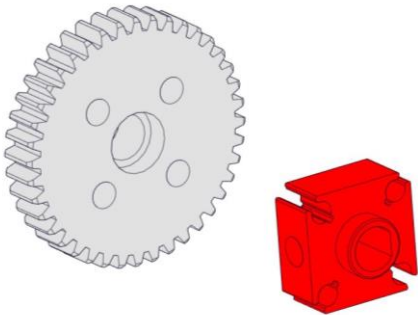


Note: Tread shown is for illustrative purposes only

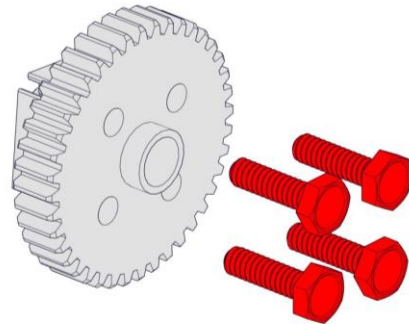
PicoBox Gear Assembly Instructions

NOTE: The following assembly instructions depict the 40 Tooth PicoBox Gear (am-3407) but also apply to the 35 Tooth Gear (am-3408) and the 45 Tooth Gear (am-3409) if you have selected the alternate gearset.

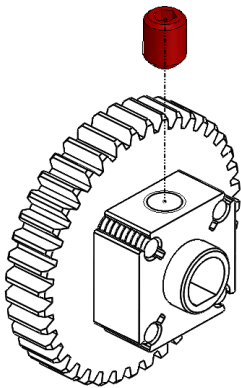
Step 1: Place a 6mm D-Bore Double Boss Nub (am-3215a) into the center bore of a PicoBox Gear and align the bolt circles of the Nub and the Gear.



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-1563) into the Nub. AndyMark suggests starting with a 1/4" Nut Driver and finishing with a 1/4" open wrench. Use Vice Grips, Pliers, or Channel Locks to hold the nub while tightening the screws.



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



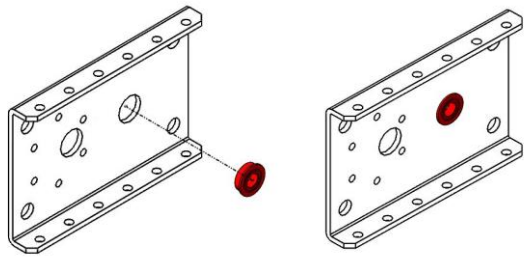
NOTE: If utilizing the 1:1 gear ratio using 40 Tooth gears, follow the above instructions a total of 8 times. If utilizing the alternate gearset for a 1.28:1 ratio, or a 1:0.78 ratio, affix nubs to all four 35 Tooth Gears and four 45 Tooth Gears.

Repeat steps 1-3 to make 8 total PicoBox Gear Assemblies.

8X

PicoBox Uno/MEO Assembly Instructions

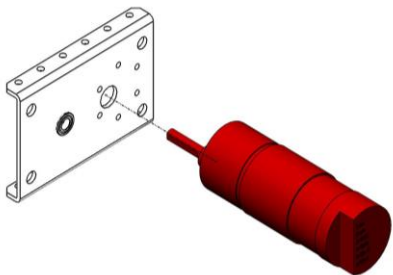
Step 1: Press a 6x12x4 Flanged Bearing (am-3377) into the 12mm hole sans bolt circle of a PicoBox Uno gearbox plate (am-3423) or PicoBox MEO Gearbox Plate (am-3475). **NOTE:** Use the Uno plate if using NeveRest Classic gearmotors; use the MEO plate if using NeveRest Orbital gearmotors.



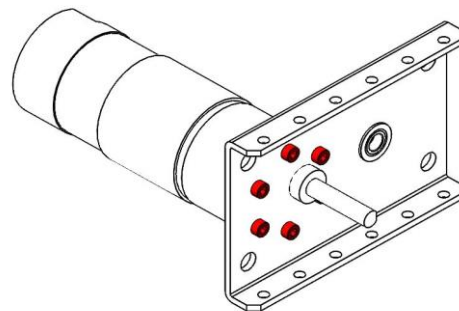
NOTE: Make sure the flange of the bearing is on the same side of the plate as the flanges, and is flush against the sheet metal of the gearbox plate.



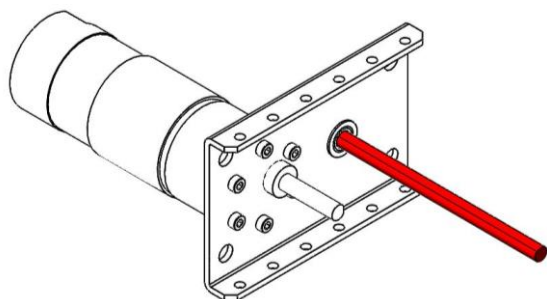
Step 2: Insert a NeveRest motor into the remaining 12mm hole of the PicoBox Uno gearbox plate or the 22mm holes of the PicoBox MEO plate, opposite of the flanges on the gearbox, and line up the threaded holes on the end of the motor with the bolt-circle holes of the gearbox plate.



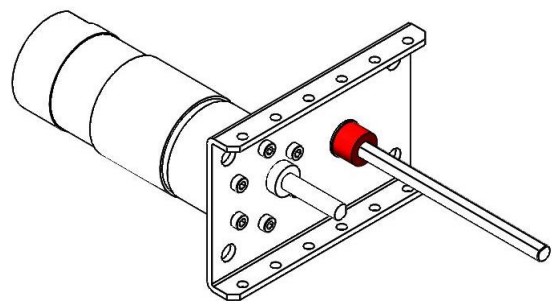
Step 3: Install six M3-0.5 x 5mm long socket head screws (am-1443) to secure the NeveRest motor to the gearbox plate. **Note:** Only four screws are used per motor if using NeveRest Orbital gearmotors.



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

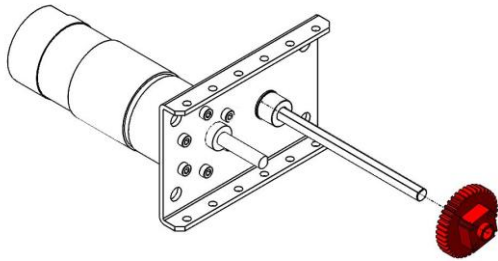


Step 5: Install the 9mm long Aluminum Spacer (am-3426) on the axle up against the previously installed bearing.

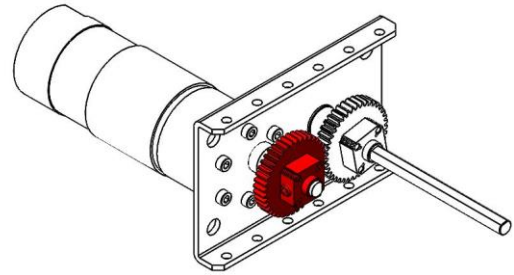


PicoBox Uno/MEO Assembly Instructions

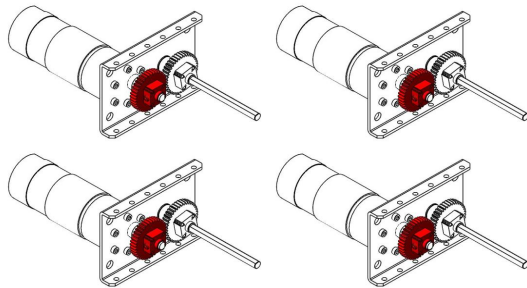
Step 6: Install one Gear Assembly onto the axle of the gearbox. Be sure to place the boss of the Gear against the spacer. Tighten the #10-32 set screw to lock the Gear Assembly in place. **Note:** If using the 1.28:1 ratio, use the 35T gear here; if using the 1:0.78 ratio, use the 45T gear here.



Step 7: Install a Gear Assembly onto the NeveRest Motor shaft such that is lined up with the Gear Assembly installed on the axle. Tighten the #10-32 set screw to lock the Gear Assembly in place. **Note:** If using the 1.28:1 ratio, use the 45T gear here; if using the 1:0.78 ratio, use the 35T gear here.

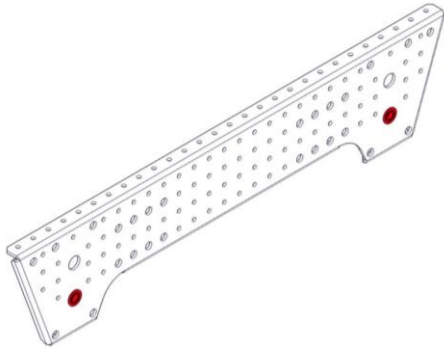


Step 8: Repeat 3 more times to make 4 total PicoBox Gearboxes for the drive train.

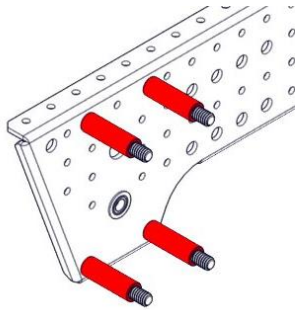


TileRiser Chassis Assembly Instructions

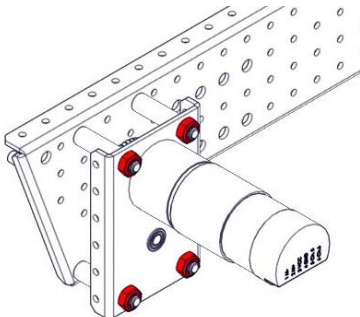
Step 1: Press two 6x12x4 Flanged Bearings (am-3377) into the lower 12mm holes of the TileRiser Plate (am-4614). Make sure the flanges of the bearings are flush against the side of the plate without flanges.



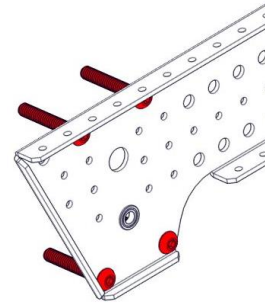
Step 3: Place a PicoBox Spacer (am-3406) over each of the 1/4-20 screws on the side of the plate without flanges.



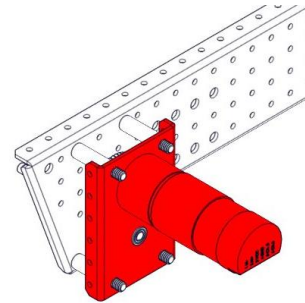
Step 5: Secure the Gearbox Assembly with 1/4-20 Nylock Jam Nuts (am-1102).



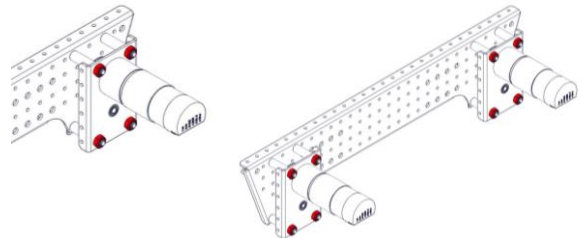
Step 2: Insert four 1/4-20 x 1.75" Button Head Screws (am-1420) into the TileRiser Plate at the indicated locations. Make sure the head of the screws are on the side of the plate with flanges.



Step 4: Insert the Axles of a Gearbox Assembly into the bearing on the TileRiser Plate. Align the 1/4-20 screws with the 1/4 in holes on each of the PicoBox Plates, and push the assemblies together.

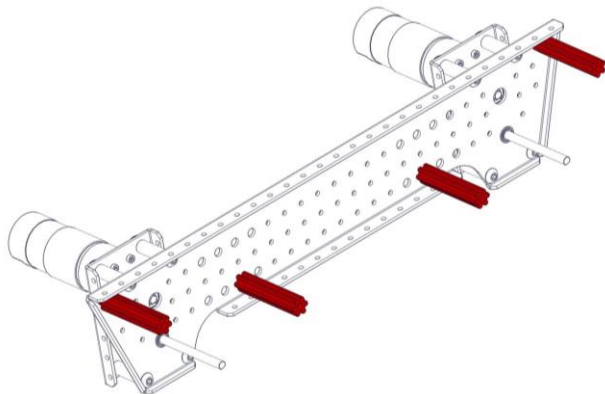


Step 6: Repeat Steps 1-5 on the other end of the plate and two more times on another plate to create two completed TileRiser Plate Assemblies.

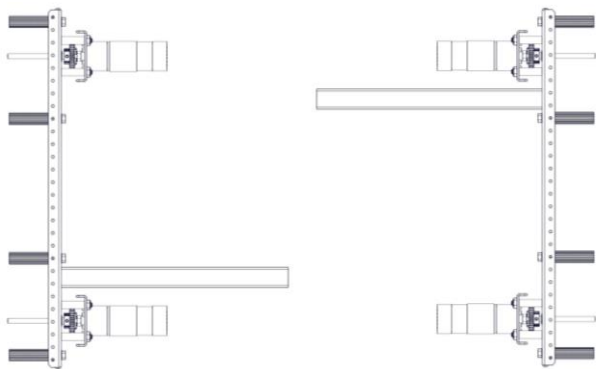


TileRiser Chassis Assembly Instructions

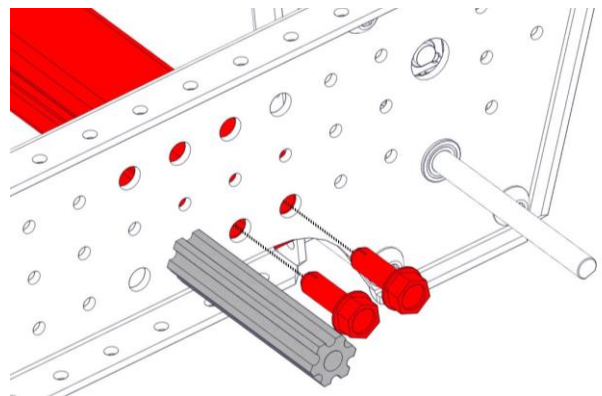
Step 7: Attach four 63mm Churro (am-3399) to one of the plates using 1/4-20 x 0.75" Self Tapping Screws (am-1310). **Note: Do not fully tighten these screws yet! The inner two churros may be located in any of the larger holes.**



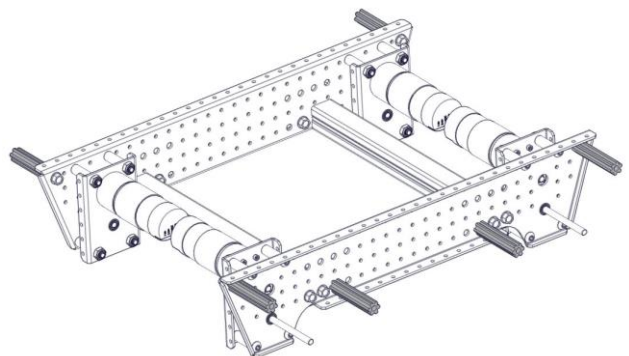
Step 9: Repeat steps 7 and 8 on the second TileRiser Plate Assembly. These must be identical so that when one is rotated they will mate properly as shown below.



Step 8: Attach one 11.25" Peanut (am-3395) to one of the plates on the same side of the plate as the PicoBox at any of the larger holes using two 1/4-20 x 0.75" Self Tapping Screws (am-1310).



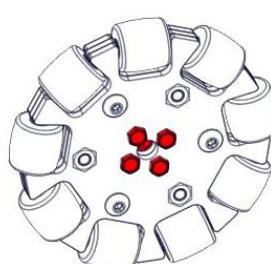
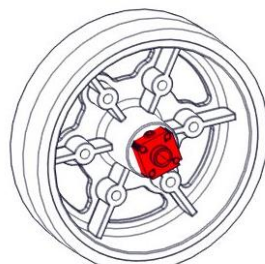
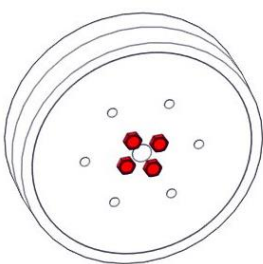
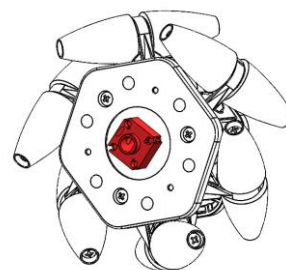
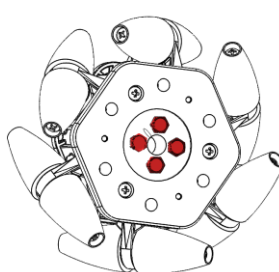
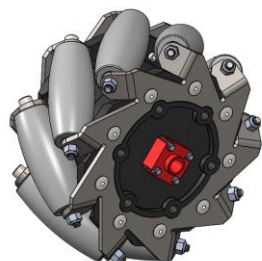
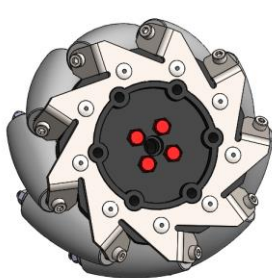
Step 10: Join the two assemblies together with four additional 1/4-20 x 0.75" Self Tapping Screws (am-1310) at the Peanuts.



TileRiser Chassis Assembly Instructions

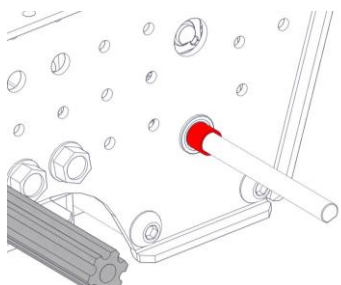
Step 11: On each of the four wheels, secure a 6mm D Bore Double Boss Nub (am-3215a) using the screws listed in the table. On the Stealth and Performance Wheels, the nub should be placed on the recessed side of the wheel.

Wheel	Screw	QTY
HD Mec	6-32 x 2" (am-1569)	4
SD Mec	6-32 x 1.25" (am-1437)	4
Stealth	6-32 x 1.25" (am-1566)	4
Perf	6-32 x 1.25" (am-1566)	4
Omni	6-32 x 0.75" (am-1564)	4

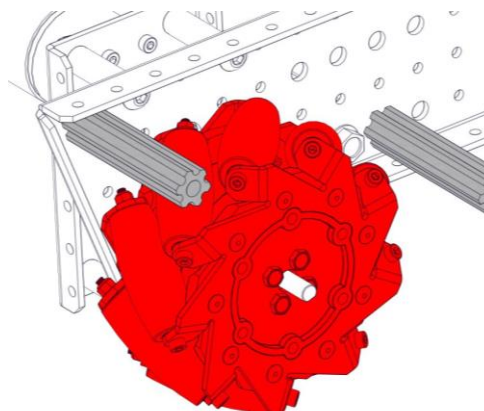


Step 12: Install spacers onto each of the four 6mm Gearbox axles depending on what wheel you are using:

Wheel	Spacer	Qty
HD Mec	none	0
SD Mec	none	0
Stealth	0.25 in (am-3424)	2
Perf	0.875 in (am-1513)	1
Omni	0.875 in (am-1513)	1



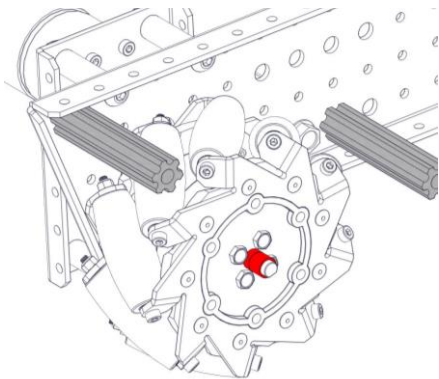
Step 13: Slide a wheel onto each of the 6mm gearbox axles. The nub should be flush against the bearing or spacer. If using Mecanum Wheels, when viewed from above, the rollers on the wheels should form an "X". **Note:** If using SD Mecanum wheels, the nub should face outwards.



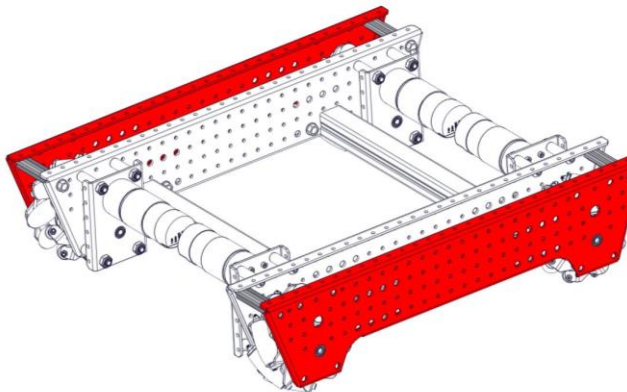
TileRiser Chassis Assembly Instructions

Step 14: Install additional spacers onto each of the four 6mm Gearbox axles depending on which wheel you are using:

Wheel	Spacer	Qty
HD Mec	0.25 in (am-3424)	2
SD Mec	0.275 in (am-1595)	1
Stealth	0.25 in (am-3424)	2
Perf	0.25 in (am-3424)	2
Orni	0.25 in (am-3424)	3

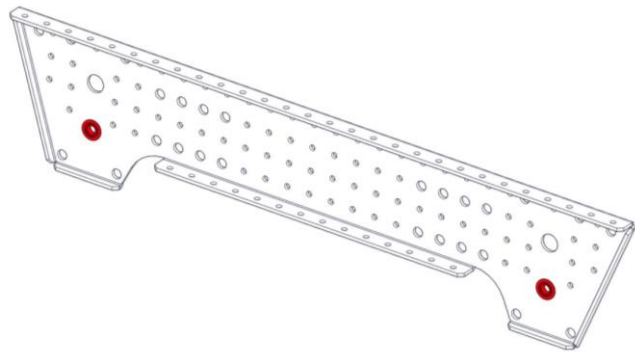


Step 16: Slide the 6mm gearbox axles into the bearings installed in the plates and make sure the flanges of the plates point towards the inside of the chassis.



Step 18: Fully tighten all screws that were previously left loose, including the set screws in the wheel Nubs.
Note: If using the SD Mecanum wheels, there should be no gaps between the nub, the spacer, and the bearings installed in Step 15.

Step 15: Press two 6x12x4 Flanged Bearings (am-3377) into the lower 12mm holes of the remaining TileRiser Plates (am-4614). Make sure the flanges of the bearings are flush against the side of the plate with flanges. Repeat for a total of two plates.



Step 17: Secure the outside plates to the chassis by threading four 1/4-20 x 0.75 in Self Tapping Screws (am-1310) into the four 63mm Churro Extrusions installed in Step 7 on each side (8 total).

