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| Step 1: Using a soldering iron, put heat nut inserts into all quarter inch holes in the frame and battery case. | Step 2: Bolt the battery case to the bottom plate with the battery using 4 button head bolts to the nut inserts. |
| Step 3: Remove the clamp on the Waveshare Robotic Arm. | Step 4: Remove the base plate of the Waveshare Robotic arm. Keep the bolts and discard the plate. |
| Step 5: Unscrew the 8 screws from the servo plate. Keep the screws. | Step 6: Move and set aside the arm of the Waveshare robotic arm to isolate the base. |
| Step 7: Unscrew the 4 bolts holding the servo plate and remove the servo plate. Keep the bolts and the plate. | Step 8: Using the bolts previously used in the base plate, bolt the Waveshare Robotic Arm’s base into the frame. |
| Step 9: Bolt the frame to the bottom plate using 4 button head bolts to the nut inserts on the bottom of the frame. | Step 10: Thread the power chord through the holes in the battery case and frame, plugging it into the shown outlets. |
| Step 11: Bolt the front, back, and side plates to the frame with button head bolts into respective nut inserts. | Step 12: Alternatively, attach the armrest in place of the front plate. |
| Step 13: Slide the protoboard assembly along the divot in the frame into the frontmost pins of the ESP32 on the Waveshare Robotic Arm. | Step 14: Bolt the standoff into the top plate with its corresponding locknut. Slide any loose wires into the curved notch. |
| Step 15: Unscrew the golden nut on the joystick and use it to secure the joystick into the big hole on the diagonal plate. | Step 16: With superglue, attach the LEDs to the smallest holes in the diagonal plate. |
| Step 17: With superglue, attach the switches to the holes on either side of the joystick in the diagonal plate. | Step 18: Secure the buttons to the diagonal plate in the row of holes along the bottom with their respective nuts. |
| Step 19: Remove the top bolts and discard them.  Step 20: Bolt the top plate to the frame with button head bolts and bolt the top plate to the ESP32 with M2.5 x 0.45, 10 mm long bolts. |  |
| Step 21: Bolt the diagonal plate to the frame with button head bolts into their respective nut-inserts. Note: connect any wires beforehand (joystick, switches, LEDs, and buttons to feather protoboard). | Step 22: With superglue, secure the 3D printed waterproofing well to the top plate, aligning the flat edge to the edge of the back plate and the divots to the button head bolts. |
| Step 23: Before reattaching the servo plate, superglue the 3D printed stopping plate to the underside of the servo plate, facing the filled end in the same direction as the end effector. Rotate the servo plate so that the dead zone (zone where servo cannot bypass) is facing the joystick. | Step 24: Reattach the Waveshare Robotic Arm with 8 previously removed screws. Optionally attach rubber bands to notches in each servo plate to dampen vibrations. |
| Step 25: Bolt the upper half of the French Cleats on the same side as the user’s dominant hand. (Right-handed in the diagram below). | Step 26: Superglue the acrylic stubs to the side plate pushed up on the edges of the French Cleats. |
| Step 27: On the Unitrack of the Permobil wheelchair, slide the square nuts in. | Step 28: Position the 1/4” aluminum mounting plate in front of the square nuts and bolt the plate in with wing bolts. |
| Step 30: Slide the heads of the hex head screws into the rails.  Step 29: Bolt the rails at a 45-degree angle with pan head screws. |  |
| Step 31: To make the connecting assembly, bolt the French cleats onto the connecting plate with button head bolts and M5 button head locknuts | Step 32: Position the connecting assembly over the hex head bolts and secure with 3/4” locknuts. |
| Step 33: Replace the button head and locknut that fits into the rails with an M6 x 0.75, 12mm long bolt and square nut. | Step 34: Slide the case’s French Cleats onto the mounting assembly’s French Cleats. |
| Step 35: Insert the key into the side of the mounting plate and into the hole in the French Cleats to keep the case from being bumped off. Turn the key to prevent it from falling out. | Step 36: Optionally, after lining the inner rectangle of the 3D printed battery cover with a silicone gasket, push the battery cover into the front plate. |
|  | Enjoy! |