

Parts List.

- 1xEsp32 Dev kit
- 1x12voltPowerSupply
- Wires
- 30x 10mm M3 screws
- 2KG of PLA plastic
- 4x STS3215 12v Servos
- 1x STS servo Controller Board
- 5x 300mm STS servo wires
- 1x Pololu D37 gearmotor with encoder (any gear ratio)
- 1x 1meter GT2 belt
- 1x GT2 gear for 6mm shaft
- Some Wood. (You can figure it out)
- 8x 22mm skateboard ball bearings.
- 12x wood screws.

Assembly Instructions

1) Print All the STLs in the Mechanical folder. Use PLA of any kind. Use 15% infill. You are probably an adult so I don't need to baby you through this.

2) Wire up an STS servo to the ESP32 according to the following picture.

[insert]

3) Upload the "changeNameOfSTSServo" code to the ESP32. This will allow you to change the name of the STS servo through the serial monitor. I recommend using Arduino IDE. If this is the first time you are using the esp32 it should take a long time to upload so don't worry about that. Make sure to mark the servo with the ID you chose to gave it. IDs should go 1,2,3,4. With 1 being closest to the base and 4 being closest to the end effector. Do not repeat an ID with a servo. You will need to connect and reconnect a new servo every time you change the IDs.

4) Assemble a wooden base and screw in the base. You are an adult so you can figure out how to do that yourself. Then place the skateboard bearings into the base. It should look like the following.

[insert]

5) Assemble the DC motor holder to mimic the following. Attach the GT2 gear to the Pololu gearmotor. Measure out the GT2 belt and attach it to "big gear" in the manner shown below

[insert]

6) Screw in the stand to the big gear.

- 7) Apply hot glue into the stand and quickly insert the STS3215 servo into its slot in the stand. Make sure the servo wires can still connect to the servo on the back side.
- 8) Repeat this hot glue process for all the servos and the locations they slot into.
- 9) Screw in the shoulder, forearm, wrist and end effector using M3 screws. You may have to use spacers in order to get things to work
- 10) Wire up the servos, each servo should connect to the servo ahead of it and the servo behind it. The first servo should also connect to the breakoutboard.
- 11) Wiring should look like this.

[image]

- 12) Upload the control code to the esp32. It explains the rest.