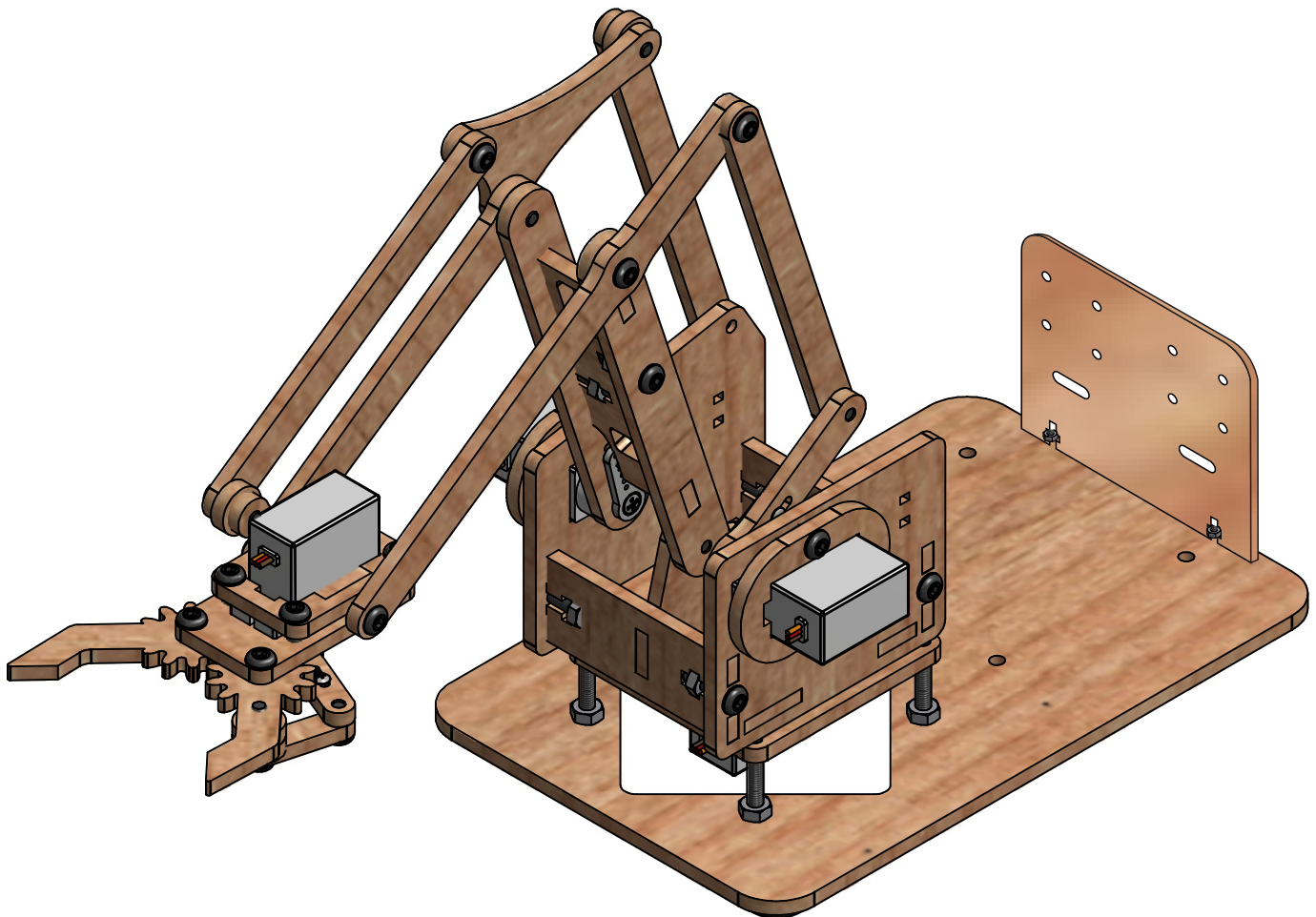# meArm v0.4 Assembly Manual

The meArm is a pocket sized, open source, robotic arm designed by Ben Gran of Nottingham, England.
This assembly manual was created by Scott Pierce (www.spiercetech.com)

Original assembly instructions can be found at: www.instructables.com/id/Pocket-Sized-Robot-Arm-meArm-V04/
Hardware source files can be found at: www.thingiverse.com/thing:360108
Software source code can be found at: www.github.com/phenoptix/MeArm
Alternate source code can be found at: www.instructables.com/id/MeArm-software
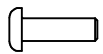
Fasteners:

Here are a list of fasteners required to build the meArm v0.4. The profiles below are actual size.
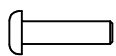
Note: The Servo Screws and Servo Mount Screws reference in the assembly manual are included with the servos and do not need to be purchased seperately.
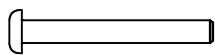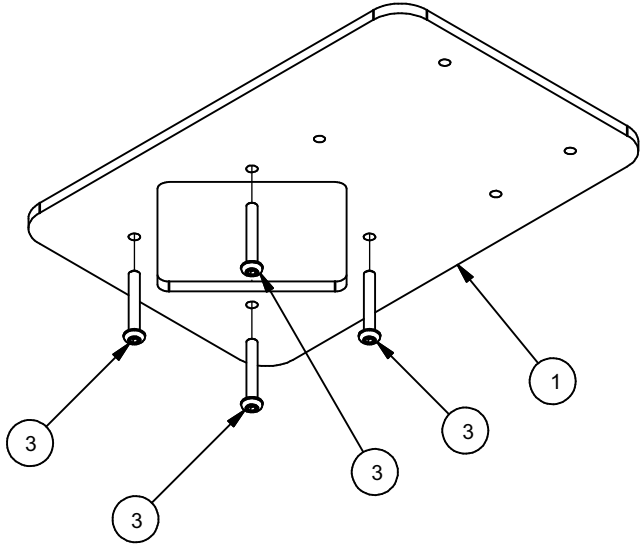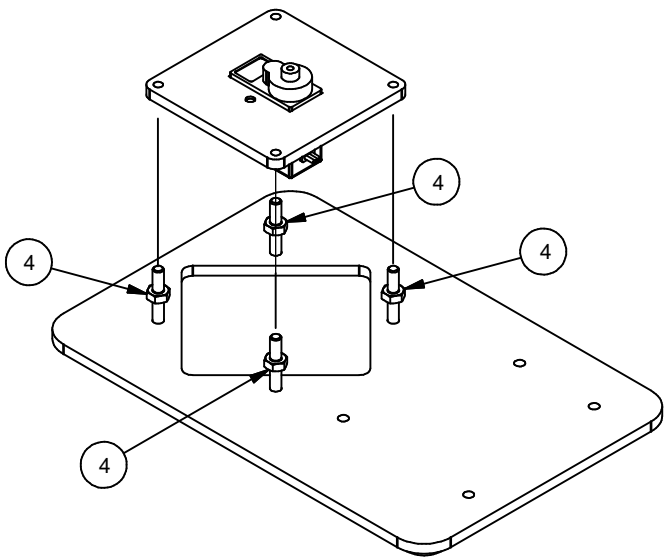
12ea - M3 Nut

9ea - M3 x 6

10ea - M3 x 8

7ea - M3 x 10

7ea - M3 x 12

4ea - M3 x 25

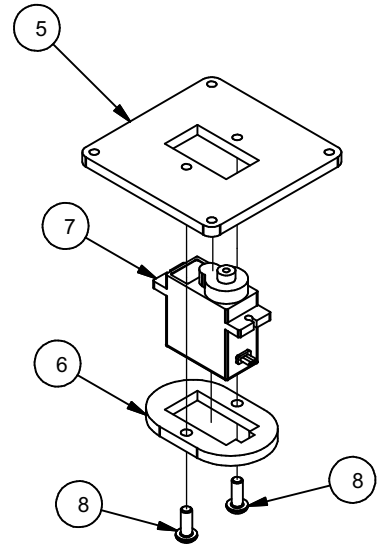| PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	Base Plate
2	4	Rubber Foot
3	4	M3 x 25mm Screw
4	4	M3 Nut
5	1	Pivot Servo Plate
6	1	Servo Retainer
7	1	9 Gram Servo
8	2	M3 x 8mm Screw

Step 1: Place (4) Rubber Feet on the bottom side of the Base Plate
Step 2: Insert (4) M3 x 25mm Screws through bottom side of the base plate

Step 3: Insert Servo into top side of Servo Retainer
Step 4: Insert Servo into bottom side of Pivot Servo Plate
Step 5: Insert (2) M3 x 8mm Screws through bottom of Servo
          Retainer and thread them into the Pivot Servo Plate.

Note: The M3 x 8mm Screws will form their own threads into the
undersized Servo Retainer Plate. Do not over tighten the screws
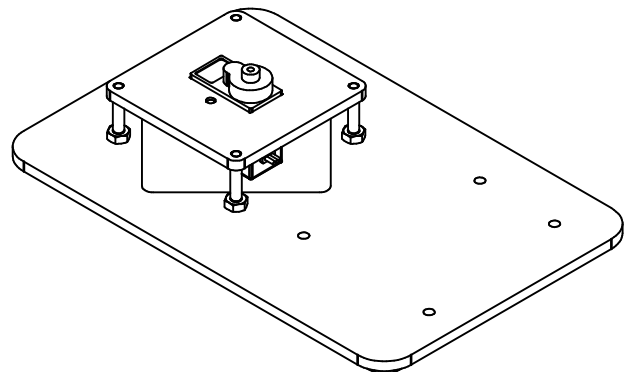or it will strip the mating holes.

Step 6: Thread (1) M3 Nut half way onto each of the (4) M3 x 25mm Screws
Step 7: Screw each of the M3 x 25mm Screws into the mating holes on the
          Pivot Servo Plate until the end of the screw is flush with the top of
          the Pivot Servo Plate

Step 8: Tighten the M3 Nuts the rest of the way down onto
          the Base Plate

PARTS LIST		
ITEM	QTY	PART NUMBER
1	2	M3 Nut
2	1	Servo Retainer
3	1	9 Gram Servo
4	2	M3 x 8mm Screw
5	1	Left Arm Servo Plate
6	1	Parallel Linkage
7	1	Long Servo Arm
8	1	M3 x 6mm Screw
9	1	Servo Single Arm
10	2	M3 x 12mm Screw
11	1	Servo Screw
12	1	Servo Mount Screw
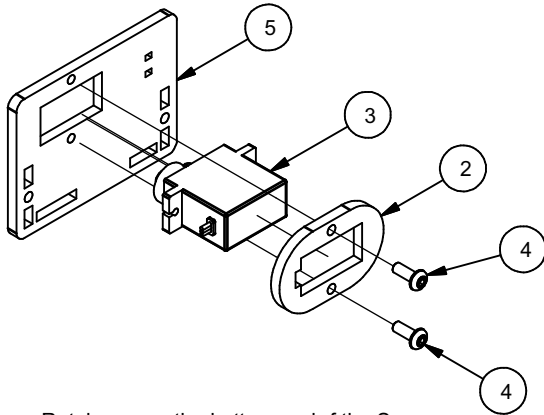
Step 9: Slide Servo Retainer over the bottom end of the Servo
Step 10: Slide Servo into the Arm Servo Plate, Left
Step 11: Insert (2) M3 x 8mm Screws into the Servo Retainer and then
screw them into the Arm Servo Plate, Left.

Step 14: Attach the Servo Arm to the Long Servo Arm
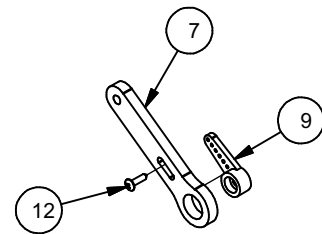Extension using (1) of the (2) longer
screws supplied with the servo
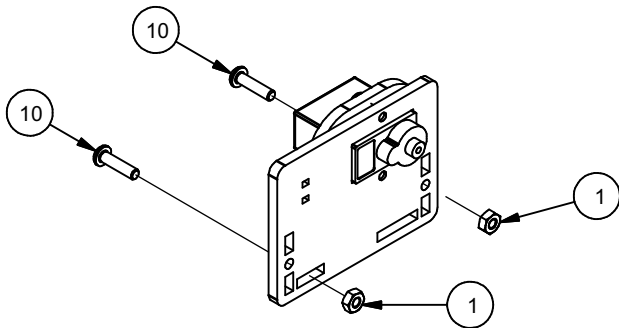
Step 12: Insert (2) M3 x 12mm Screws into back side of
Left Arm Servo Plate
Step 13: Thread (1) M3 Nut onto each M3 x 12mm Screw
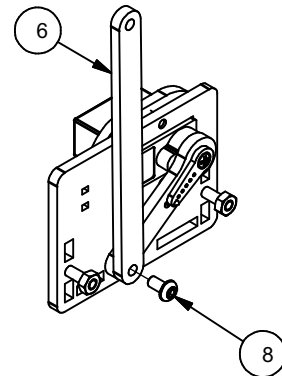until nut is flush with the end of the screw
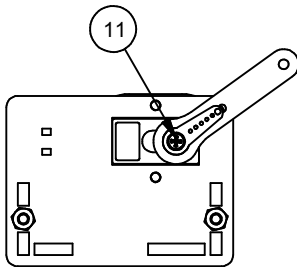
Step 15: Press the Servo Arm assembly onto the Servo
and then gently rotate the Servo Arm clockwise
by hand until it stops. After it has stopped,
remove the Servo Arm assembly from the Servo
and position it as shown in the picture above.
Step 16: Insert Servo Screw that is supplied with the Servo

Step 17: Insert (1) M3 x 6mm Screw into Parallel Linkage
and thread it into the Servo Arm Extension

| PARTS LIST		
ITEM	QTY	PART NUMBER
1	2	M3 Nut
2	1	Servo Retainer
3	1	9 Gram Servo
4	2	M3 x 8mm Screw
5	1	Parallel Linkage
6	1	M3 x 6mm Screw
7	1	Servo Single Arm
8	2	M3 x 12mm Screw
9	1	Right Arm Base Joint
10	1	Right Arm Servo Plate
11	1	Servo Screw
12	1	Servo Mount Screw
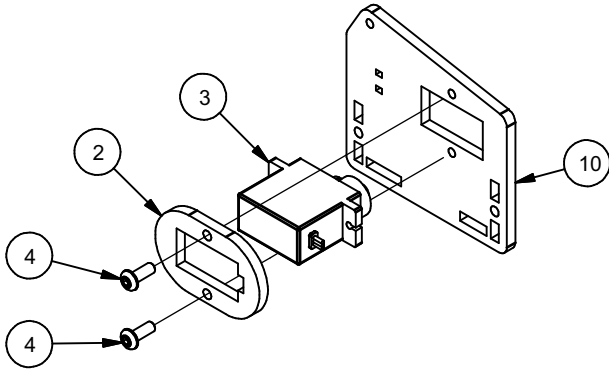
Step 18: Slide Servo Retainer over the bottom end of the Servo
Step 19: Slide Servo into Right Arm Servo Plate
Step 20: Insert (2) M3 x 8mm Screws into the Servo Retainer and then screw them into the Left Arm Servo Plate
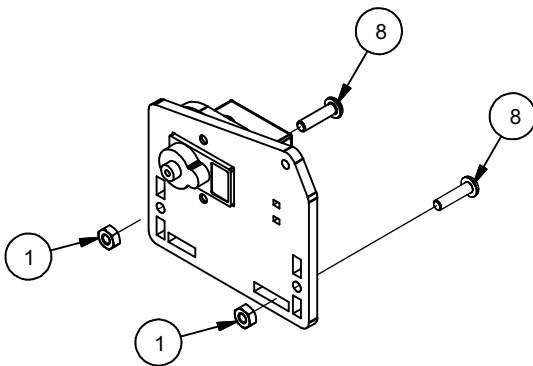
Step 21: Insert (2) M3 x 12mm screws into back side of Right Arm Servo Plate
Step 22: Thread (1) M3 Nut onto each M3 x 12mm screw until nut is flush with the end of the screw
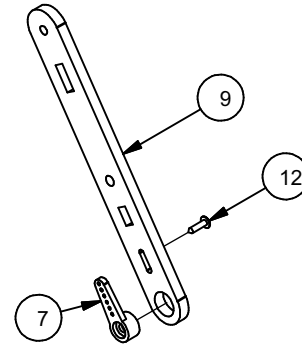
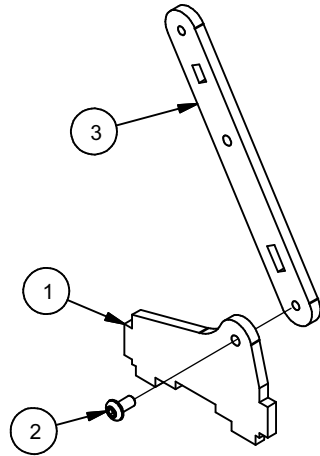Step 23: Attach the Servo Arm to the Right Arm Base Joint using (1) of the Servo Mount Screws supplied with the Servo.
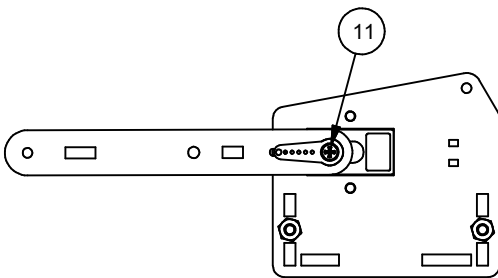
Step 24: Press the Arm Base Joint assembly onto the Servo and then gently rotate the Servo Arm counter clockwise by hand until it stops. After it has stopped, remove the Arm Base Joint assembly from the Servo and position it as shown in the picture above.
Step 25: Insert the Servo Arm Screw that is supplied with the Servo
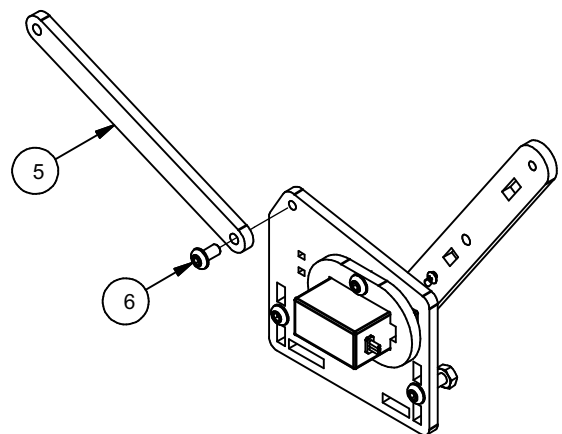
Step 26: Insert (1) M3 x 6mm Screw into the Parallel Linkage and thread it into the Right Arm Servo Plate

ITEM	QTY	PART NUMBER
1	1	Left Arm Mount Tab
2	1	M3 x 6mm Screw
3	1	Left Arm Base Joint
4	1	Arm Bottom Plate
5	1	Servo Double Arm
6	2	Servo Mount Screw

Step 27: Insert (1) M3 x 6mm screw through the Lef t Arm
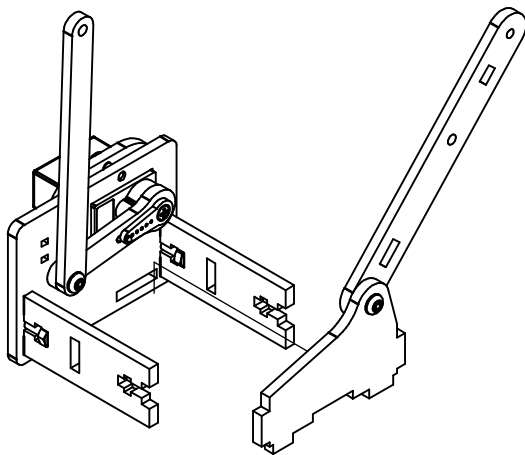   Mount Tab and thread it into the Left   Arm Base Joint
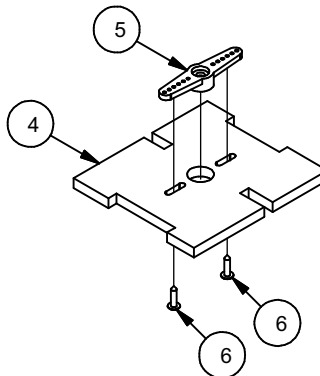
Step 28: Attach Servo Arm to the Arm Bottom Plateusing (2)
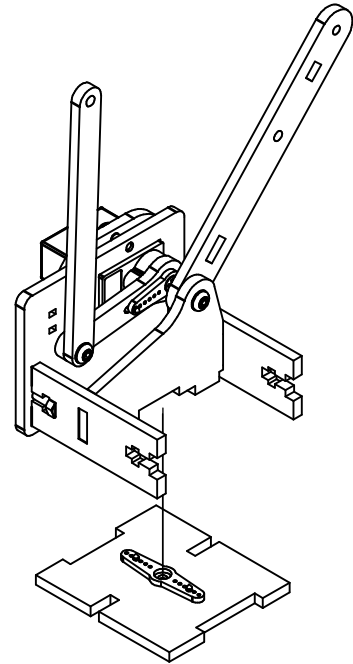   Servo Mount Screws supplied with the Servo.
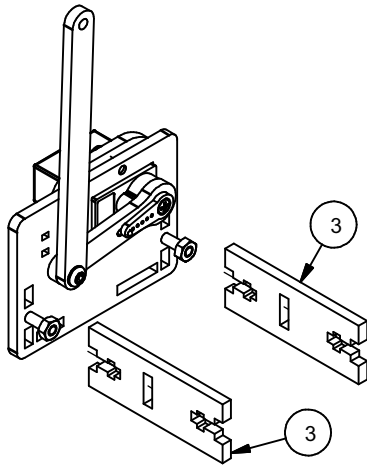
Step 29: Insert (2) Arm Base Crossmembers into the Left Arm Servo Plate. Do not tighten screws yet.
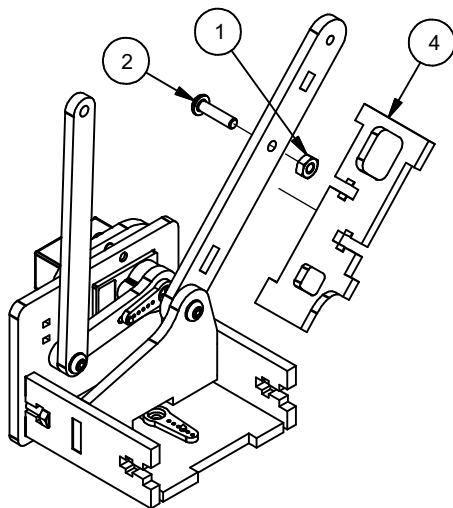
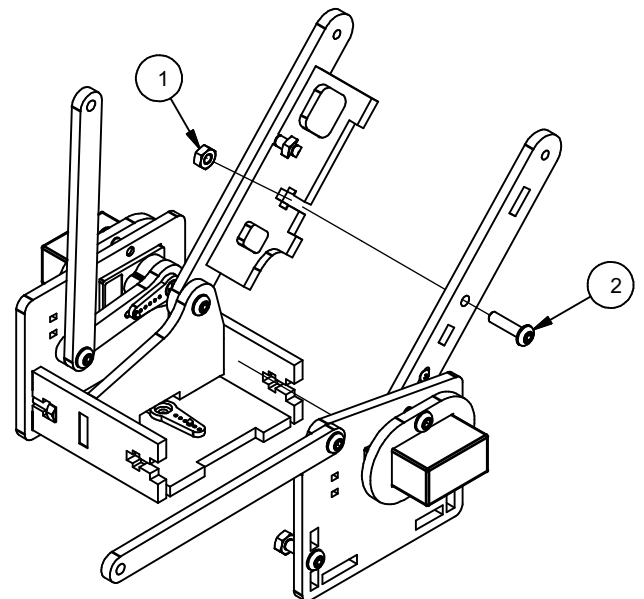| PARTS LIST		
ITEM	QTY	PART NUMBER
1	2	M3 Nut
2	2	M3 x 12mm Screw
3	2	Arm Base Crossmember
4	1	Main Arm Cross Web

Step 30: Insert Left Arm Mount Tab assembly into the slots of the Arm Base Crossmembers

Step 31: Insert the Arm Bottom Plate into the tabs and slots of the Left Arm Servo Plate and the Arm Base Crossmembers

Step 32: Join the Main Arm Cross Web to the Left Arm Base Joint
Step 33: Insert (1) M3 x 12mm Screw into the Left Arm Base Joint then tighten nut, securing the Left Arm Base Joint to the Main Arm Cross Web

Step 34: Join the Right Arm Servo Plate assembly to the rest of the assembly from the previous steps using (1) M3 Nut and (1) M3 x12mm Screw.
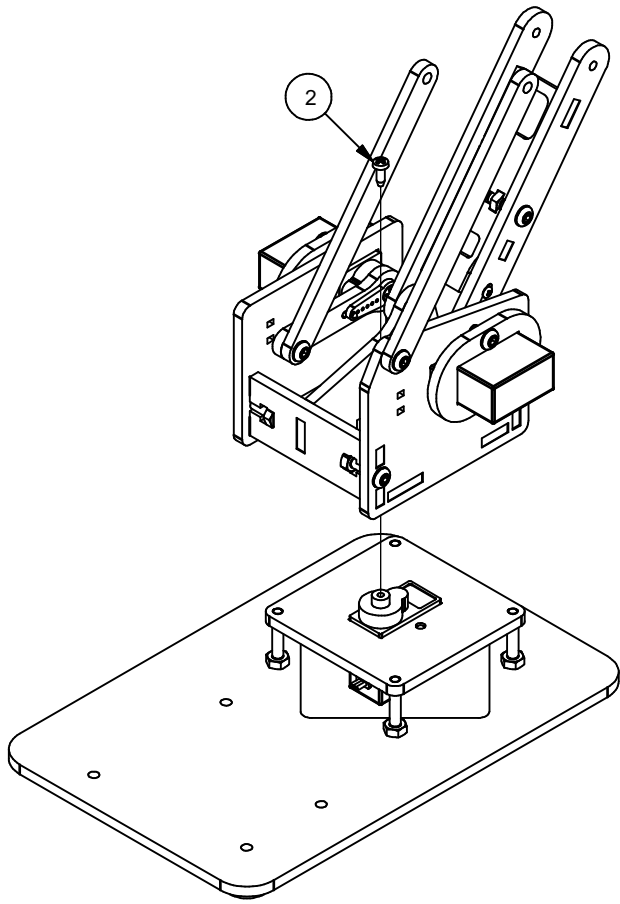
PARTS LIST		
ITEM	QTY	PART NUMBER
1	2	M3 x 6mm Screw
2	1	Servo Screw
3	1	Left Wrist Joint

Step 35: Attach the Arm Assembly to the Base assembly and then secure them together using the included Servo Screw.
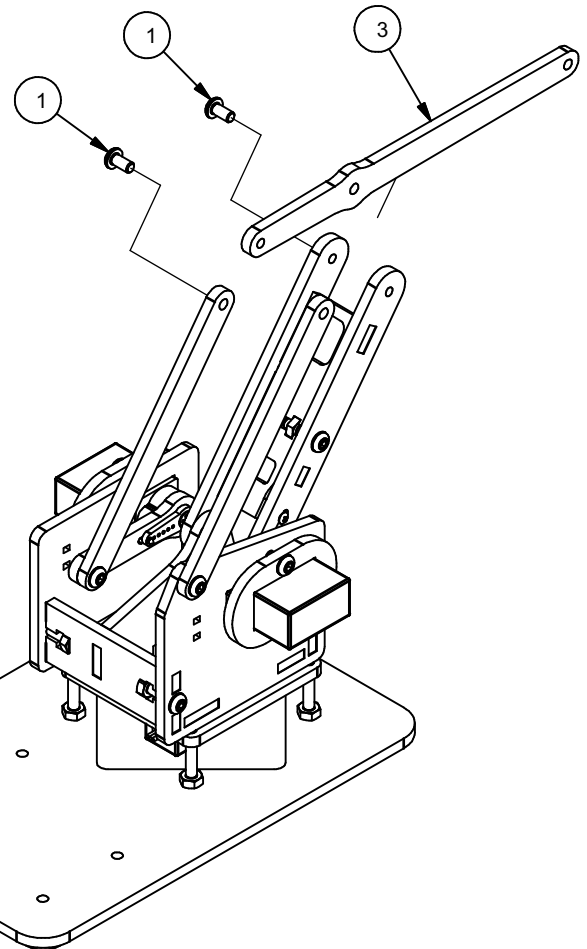
Step 36: Attach the Left Wrist Joint to the Parallel Linkage and the Left Arm Base Joint using (2) M3 x 6mm Screws

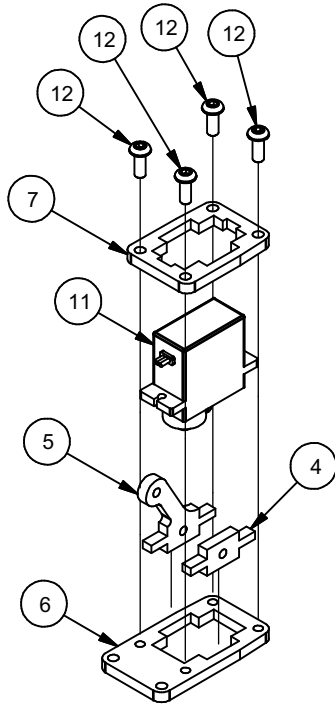| PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	Parallel Linkage
2	1	M3 x 6mm Screw
3	1	Parallel Linkage Connector
4	1	Right Wrist Joint
5	1	Spacer
6	2	M3 x 10mm Screw
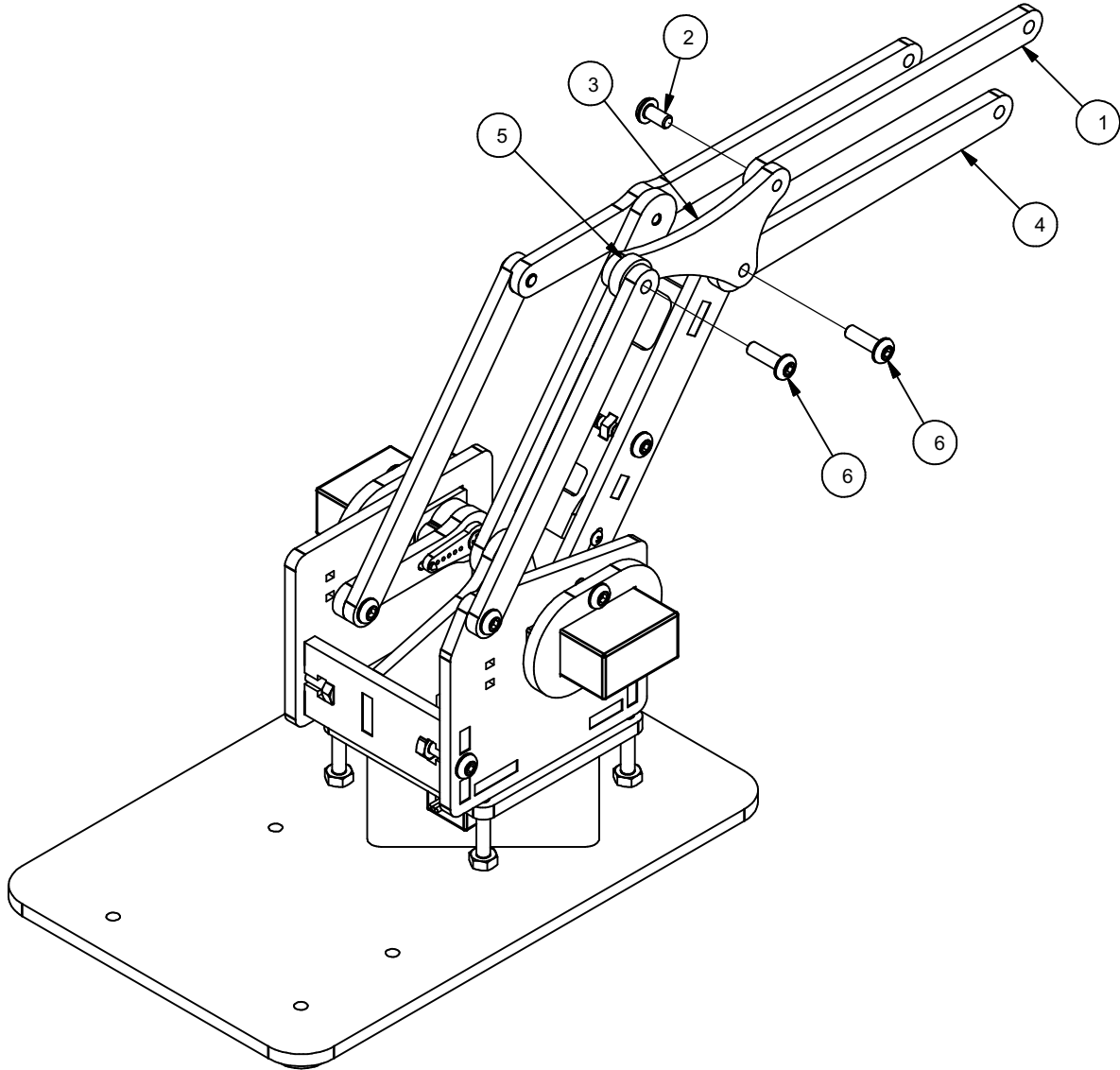
Step 37: Attach (1) Parallel Linkage to the Parallel Linkage Connetor using (1) M3 x 6mm Screw
Step 38: Attach the Parallel Linkage Connector to the Right Wrist Joint and the Left Arm Base Joint using (1) M3 x 10mm Screw
Step 39: Attach the last hole of the Parallel Linkage Connector to the Parallel Linkage on the Right Arm Servo Plate using
            (1) M3 x 10mm Screw. Make sure to pl ace (1) Spacer between the Parallel Linkage Connector and the Parallel Linkage.

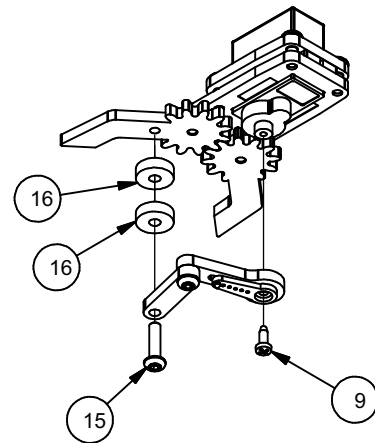| PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	Left Gripper
2	1	Right Gripper
3	1	Gripper Actuating Arm
4	1	Left Wrist Attachment
5	1	Right Wrist Attachment
6	1	Clamp Bottom Servo Mount
7	1	Clamp Top Servo Mount
8	1	Short Servo Arm
9	1	Servo Screw
10	1	Servo Single Arm
11	1	9 Gram Servo
12	4	M3 x 8mm Screw
13	3	M3 x 6mm Screw
14	1	Servo Mount Screw
15	1	M3 x 12mm Screw
16	2	Spacer

Step 40: Slide the Servo into the Clamp Top Servo Mount.
Step 41: Slide the Right and Left Wrist Attachments into the Clamp Top
        Servo Mount as show.
Step 42: Slide the Clamp Bottom Servo Mount over the Servo.
Step 43: Insert (4) M3 x 8mm Screws into the Clamp Top Servo Mount and
        thread them into the Clamp Bottom Servo Mount.
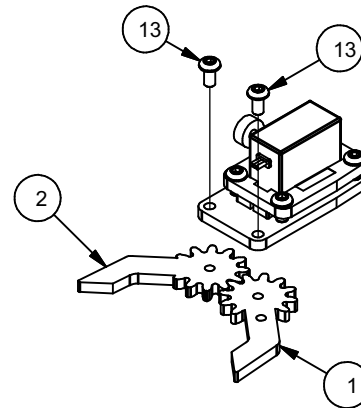
Step 44: Attach the Left Gripper and Right Gripper to the Servo
   assembly from the previous step using (2) M3 x 6mm
        Screws
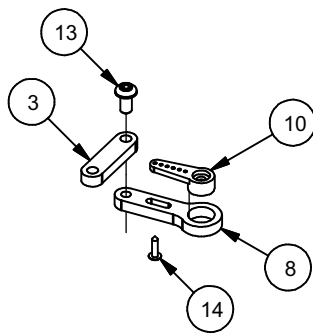
Step 45: Attach (1) Servo Single Arm to the Short Servo Arm
        using (1) Servo Mount Screw
Step 46: Attach the Gripper Actuating Arm to the Short Servo Arm
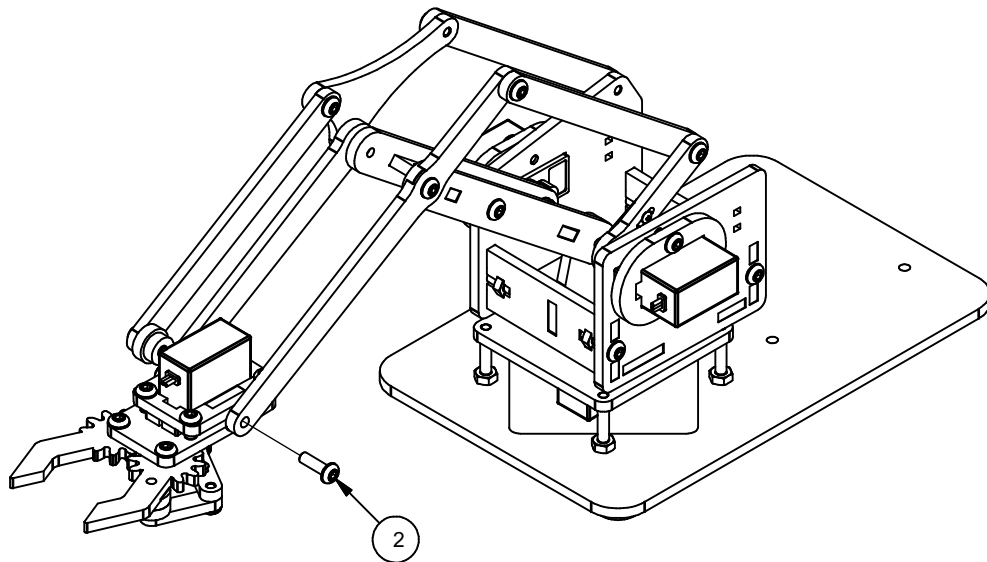   using (1) M3 x 6mm Screw

Step 47: Attach the Gripper Arm assembly from the previous step
        to the Servo assembly using (1) 9 Gram Servo Screw,
        (1) M3 x 12mm Screw, and (2) Spacers

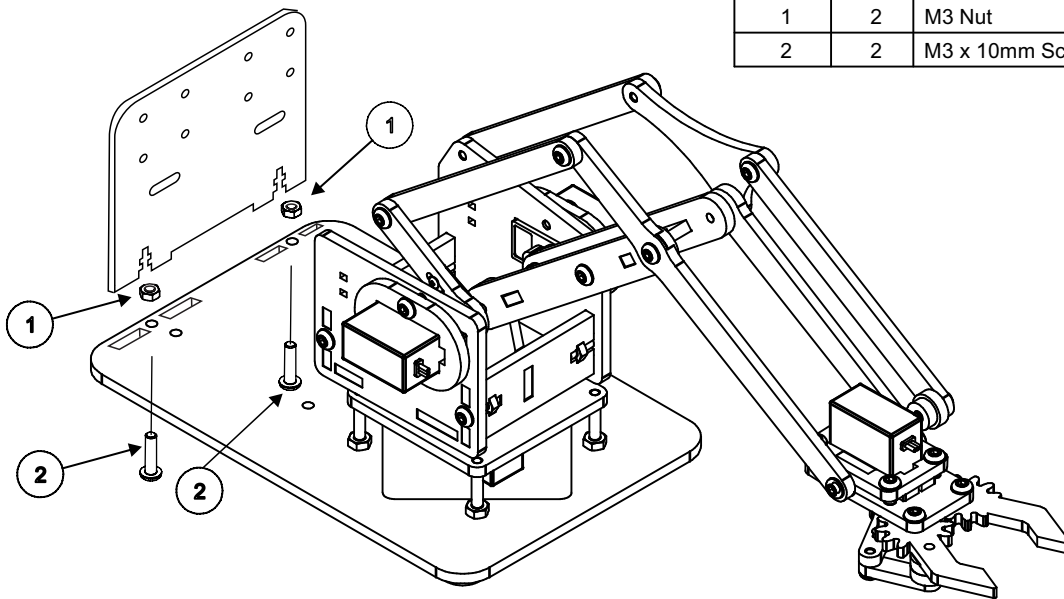| PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	Spacer
2	3	M3 x 10mm Screw
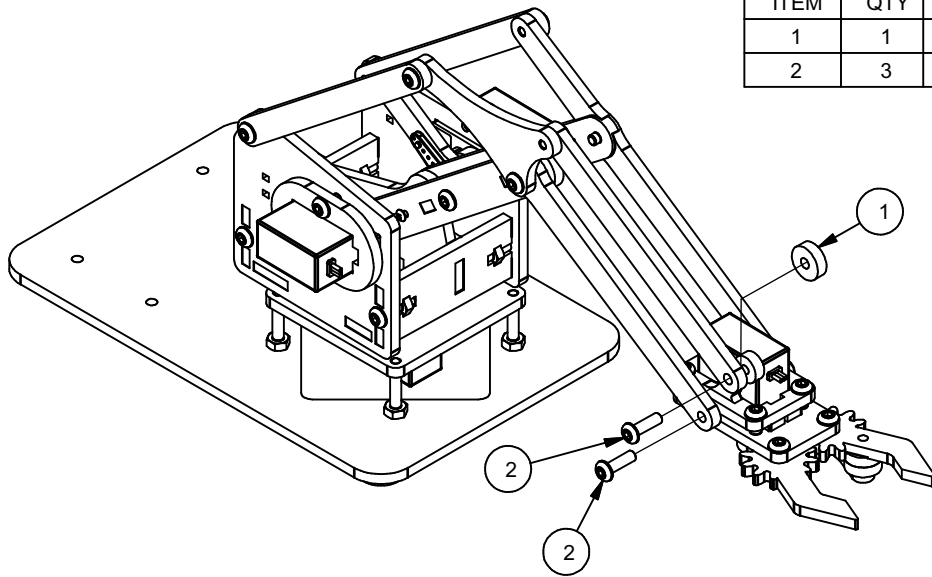
Step 48: Attach the right side of the Gripper assembly to the rest of the meArm using
(2) M3 x 10mm screws and (1) Spacer

Step 49: Attach the left side of the Gripper assembly to the rest of the meArm using
(1) M3 x 10mm screw

PARTS LIST		
ITEM	QTY	PART NUMBER
1	2	M3 Nut
2	2	M3 x 10mm Screw

Step 50: In this step we are going to mount the Joystick holder. Just place the support on top of the base.
use the 4 fittings and then use the (2) M3 x 10mm screws and (1) 2 M3 nuts to finalize the fixation.
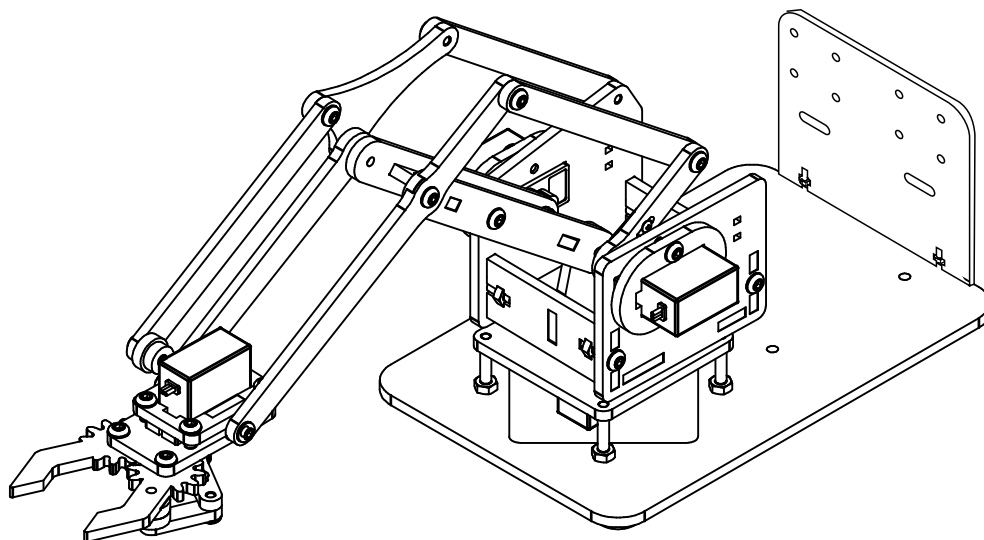
Congratulations You have just finished assembling your robotic arm.
Now just develop the programming with the movements you
want the arm to perform.
Good fun and great learning.