

# Assembly of the Robotic Arm

Before assembling the robotic arm, we first need to adjust the 5 servos of the robotic arm by 90 degrees.

## 1. The basic assembly of the robotic arm

The basic assembly of the robotic arm is mainly divided into three parts:

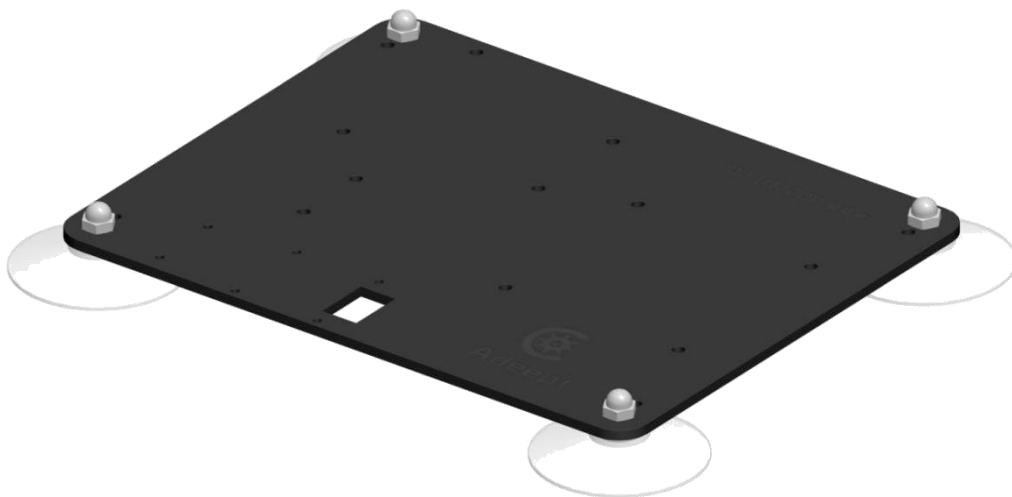
1. **Assembly of Pedestal**
2. **Assembly of Rocker Arm**
3. **Connection and assembly of the Pedestal and Rocker Arm**

### 1.1. Assembly of Pedestal.

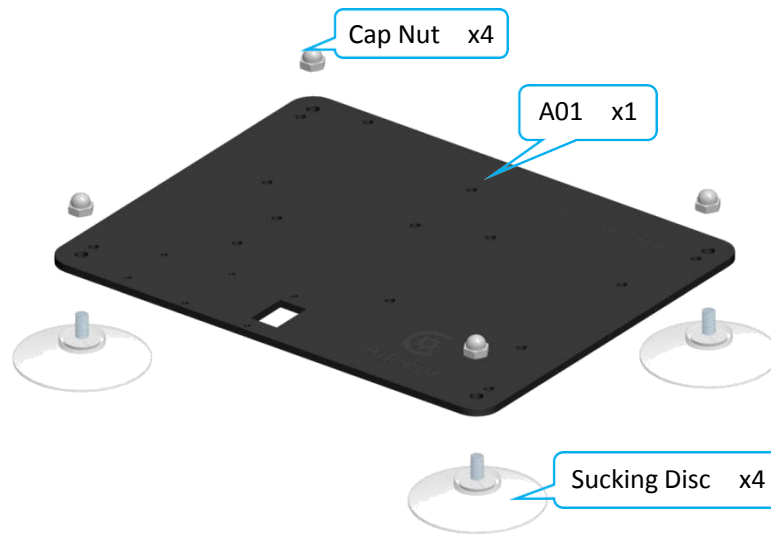
#### 1.1.1. Assembly of **Substrate(A01)**:

1. Fix four Sucking Discs on the four corners of A01.

Effect diagram after assembling



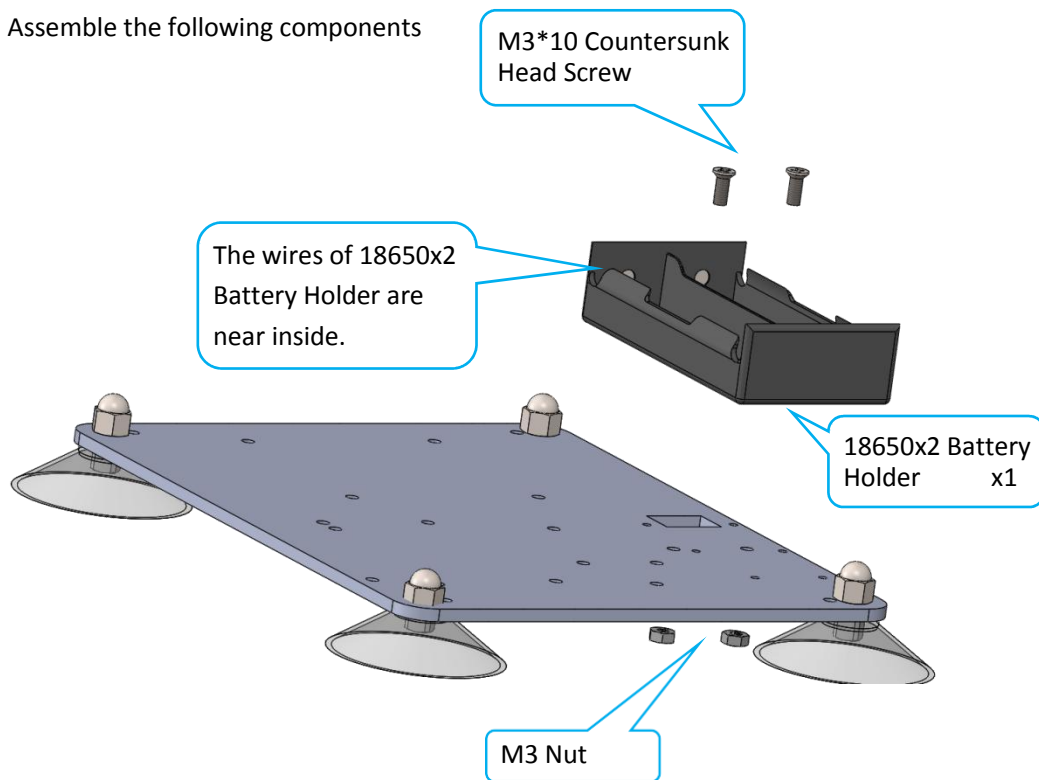
Assemble the following components



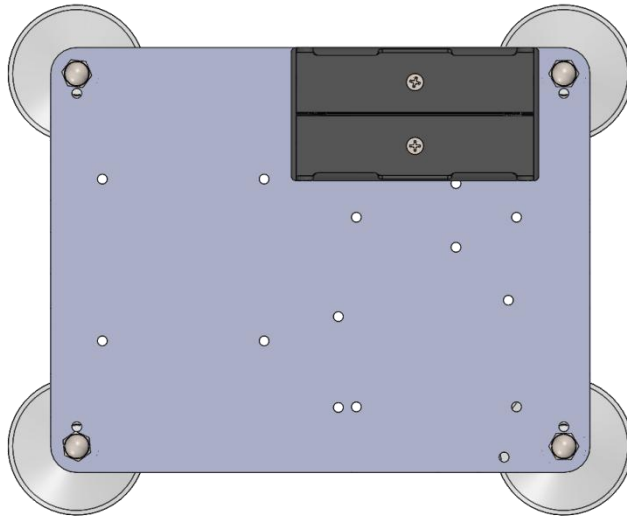
### 1.1.2. Assembly of Battery Holder:

2. Fix 18650x2 Battery Holder to A01.

Assemble the following components



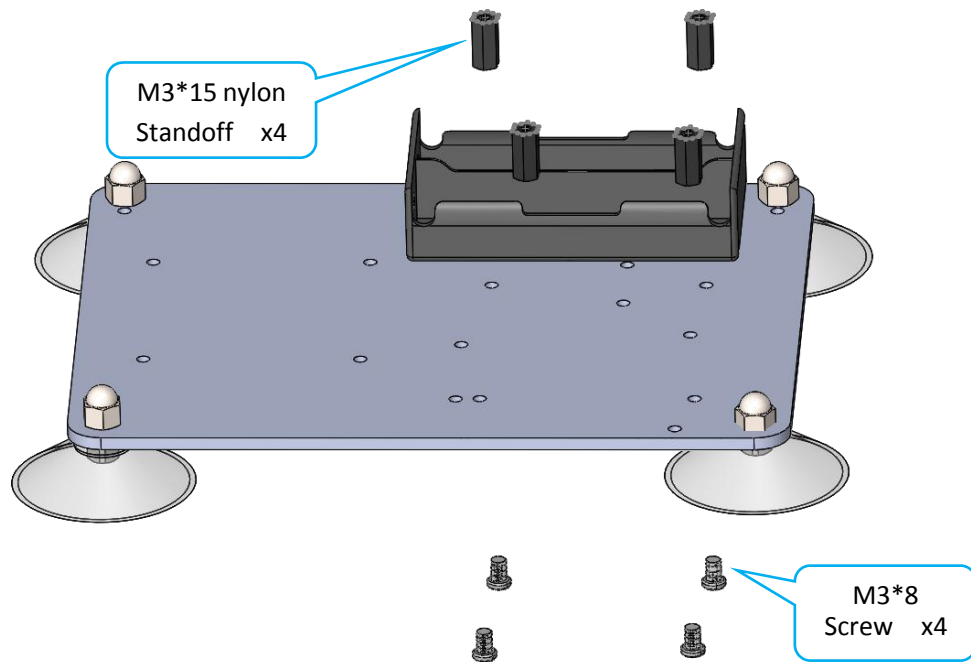
Effect diagram after assembling



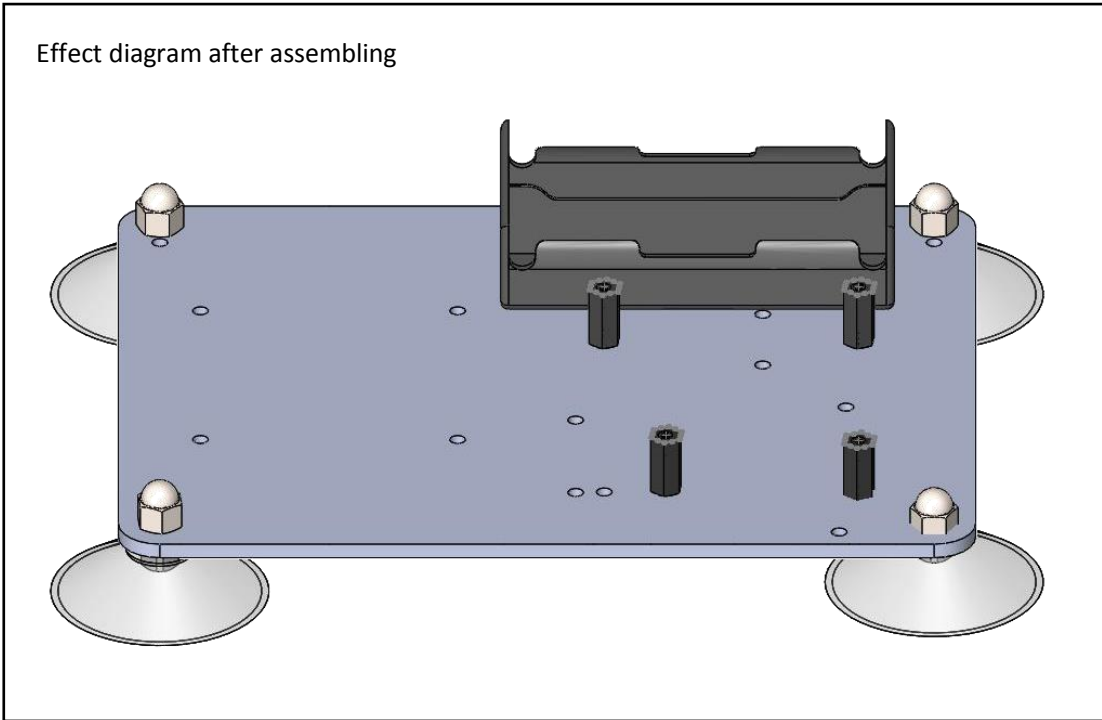
### 1.1.3. Assembly of Adept Arm Drive Board:

3. Fix four M3\*15 Nylon Standoffs to A01.

Assemble the following components



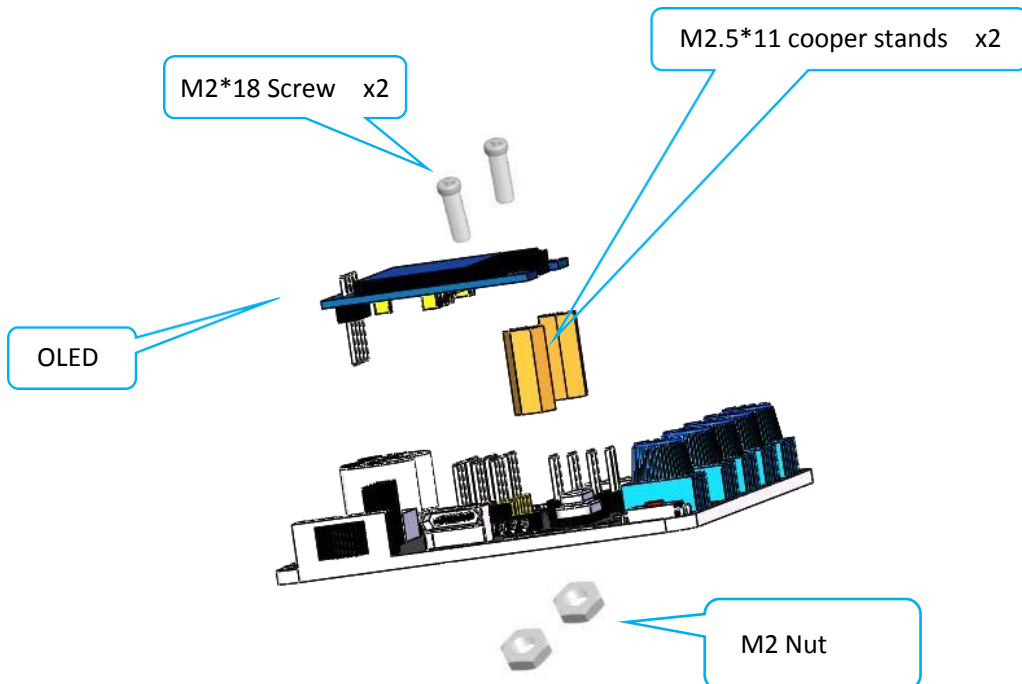
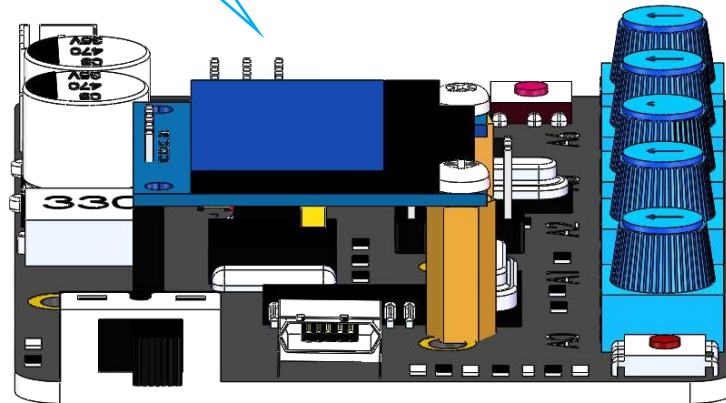
Effect diagram after assembling



4. Fix OLED to drive

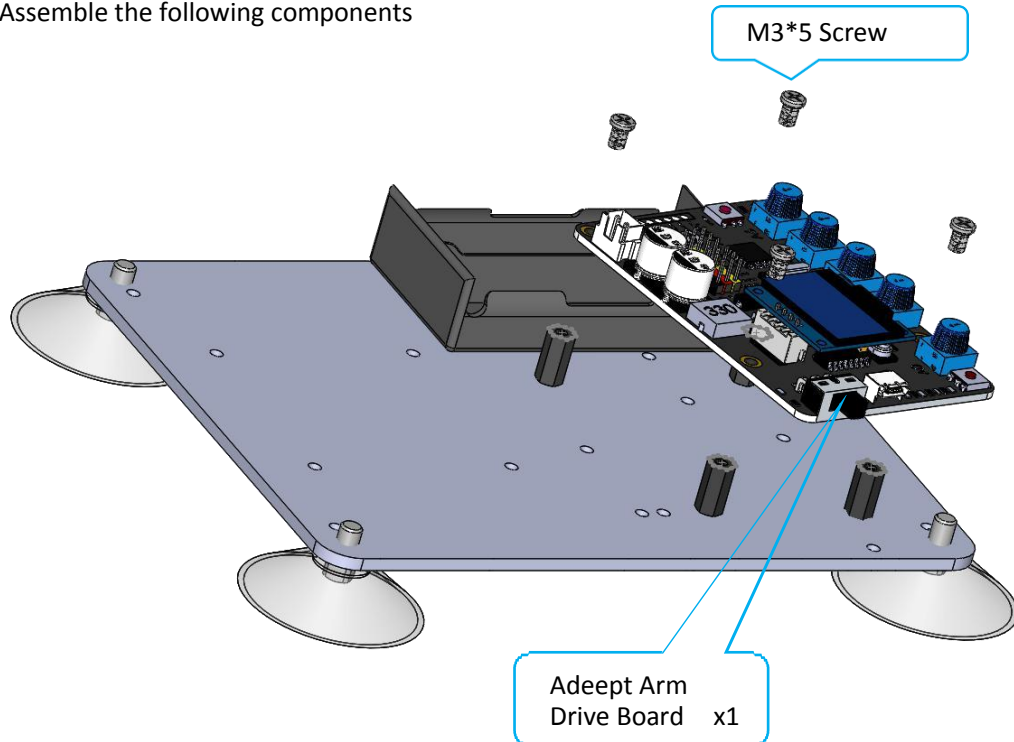
Effect diagram after assembling

OLED should be correct with the robot Arm drive Hat connection, the screen should be placed in the driver board

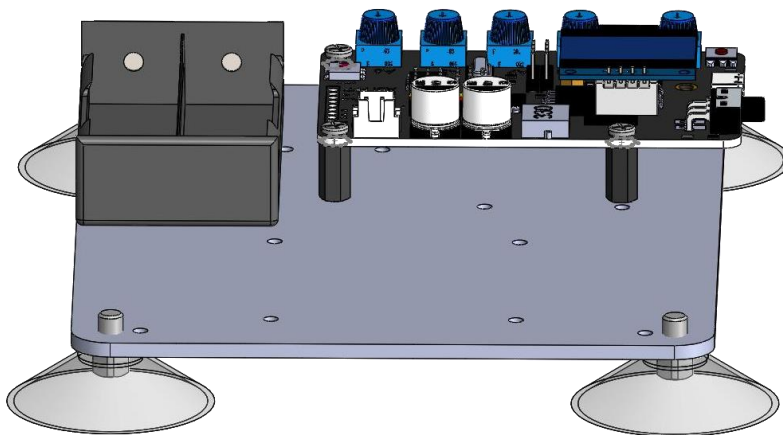


5. Fix Adeept Arm Drive Board to M3\*15 Nylon Standoffs.

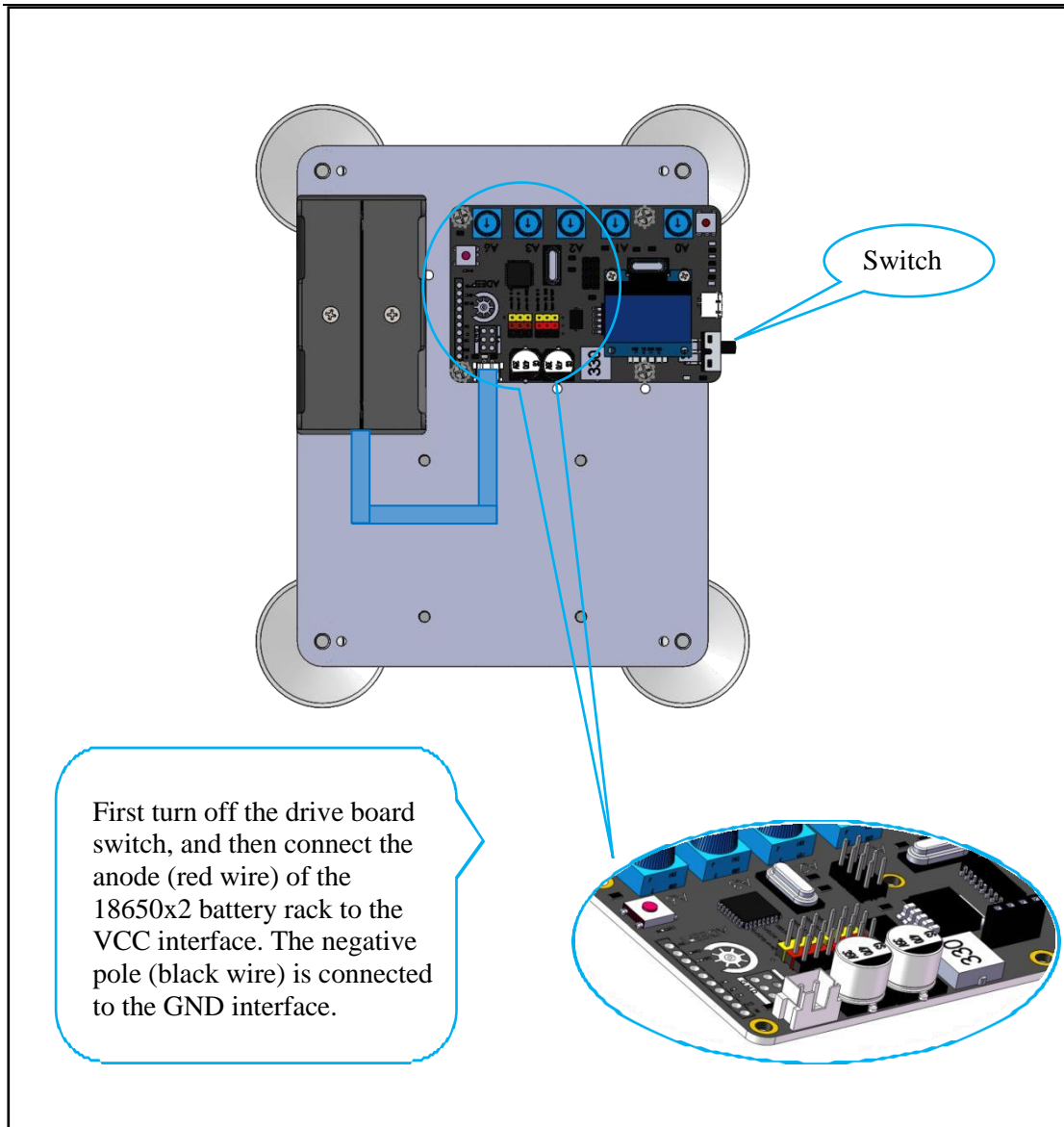
Assemble the following components



Effect diagram after assembling



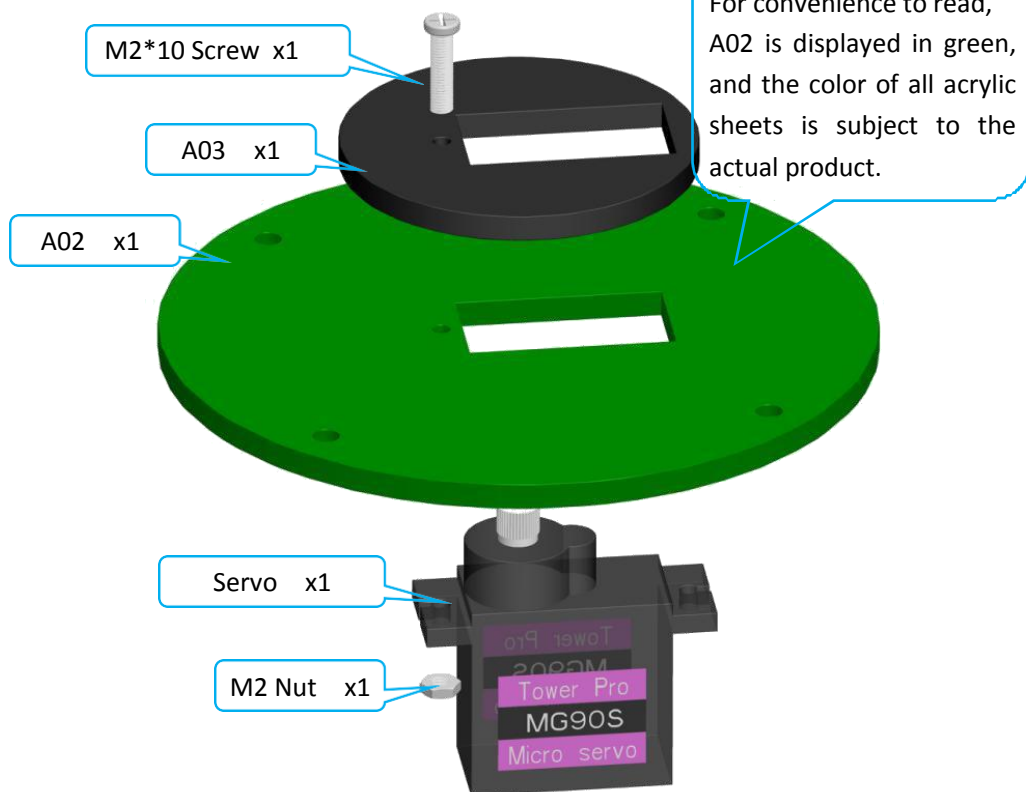
Connect the 18650x2 Battery Holder to Adept Arm Drive Board.



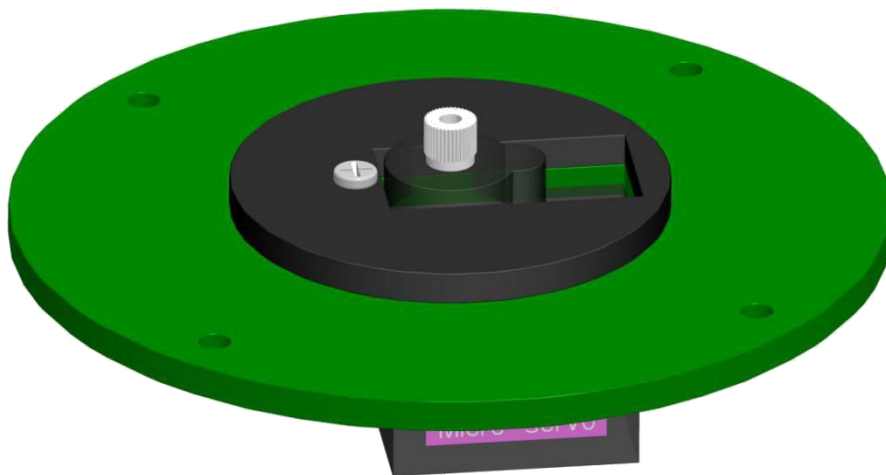
### 1.1.4. Assembly of **Turntable**:

6. Fix a debugged servo to A02 and A03.

Assemble the following components



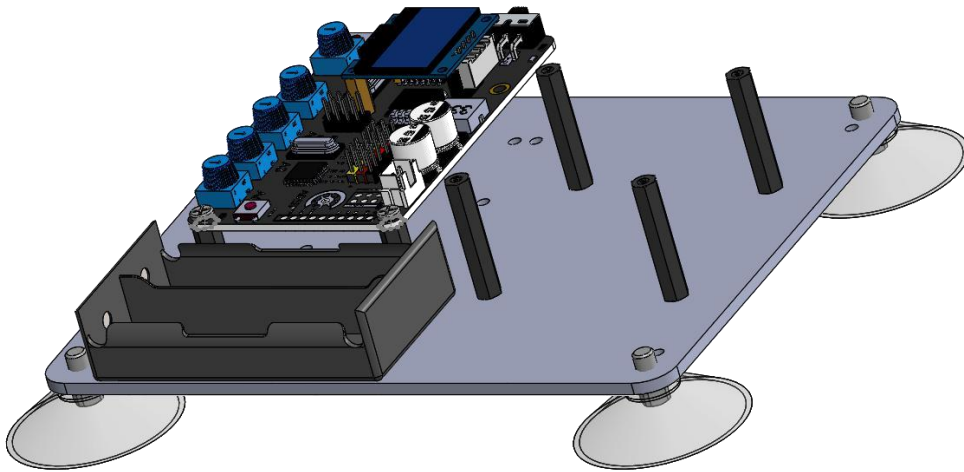
Effect diagram after assembling



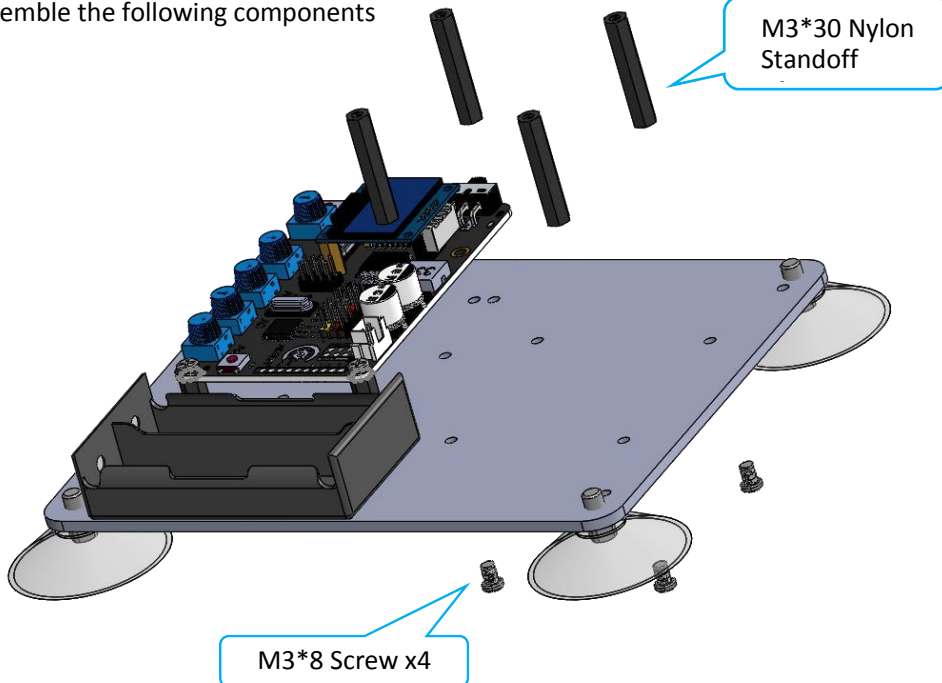
7. Fix four M3\*30 Nylon Standoffs to A01.



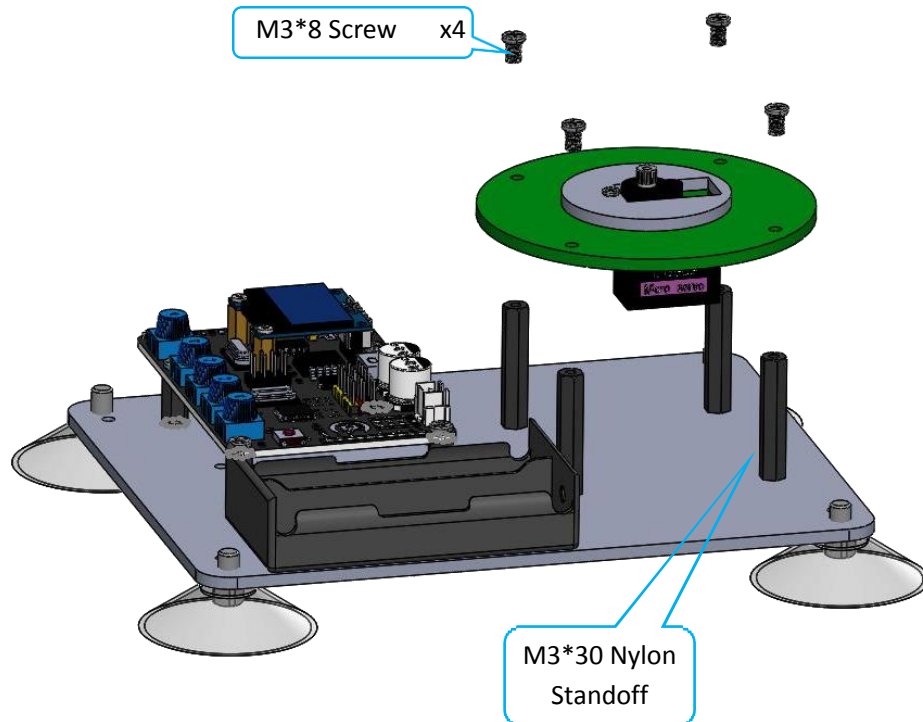
Effect diagram after assembling



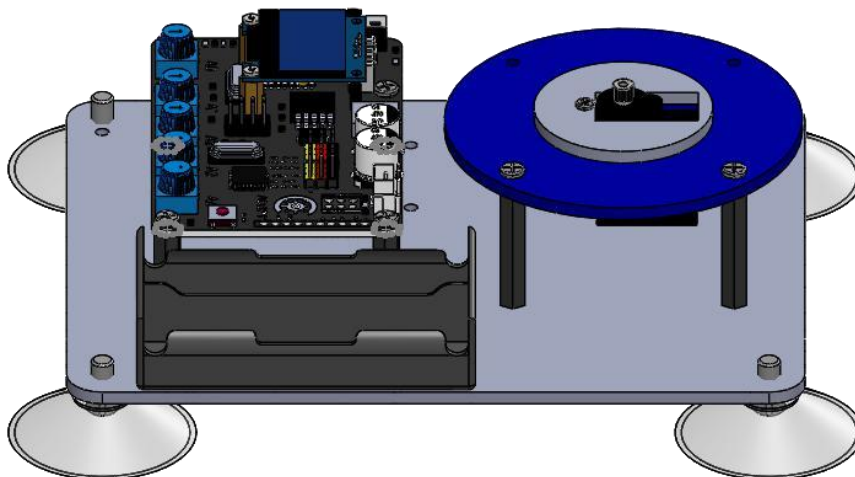
Assemble the following components



Assemble the following components



Effect diagram after assembling



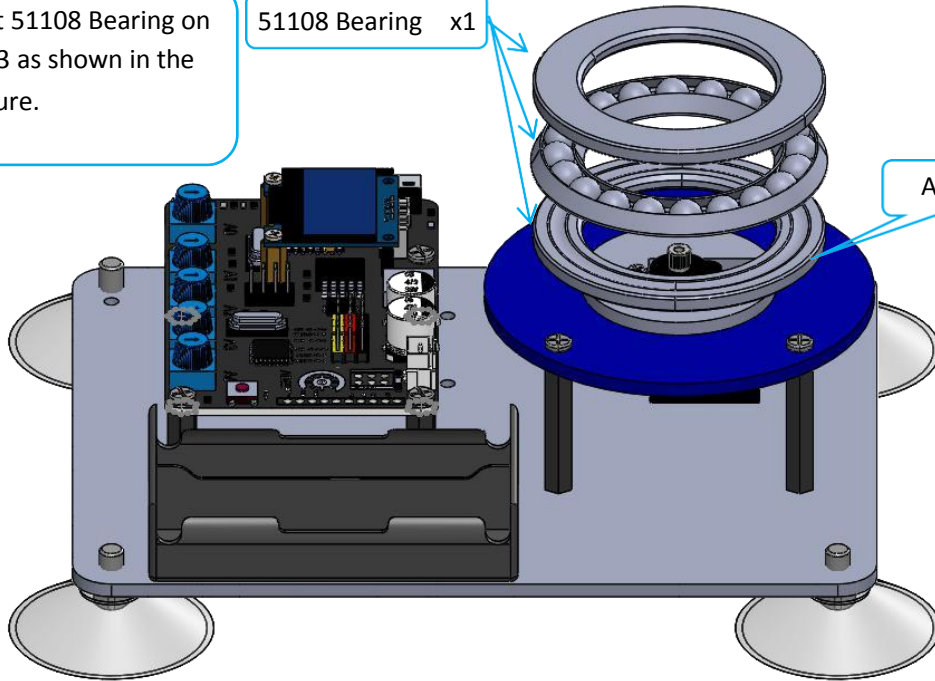
## 8. Assemble 51108 Bearing.

Assemble the following components

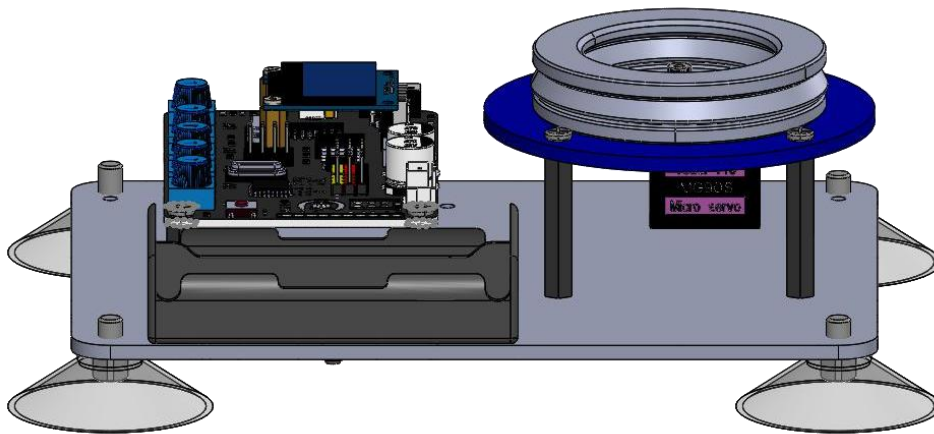
Put 51108 Bearing on A03 as shown in the figure.

51108 Bearing x1

A03

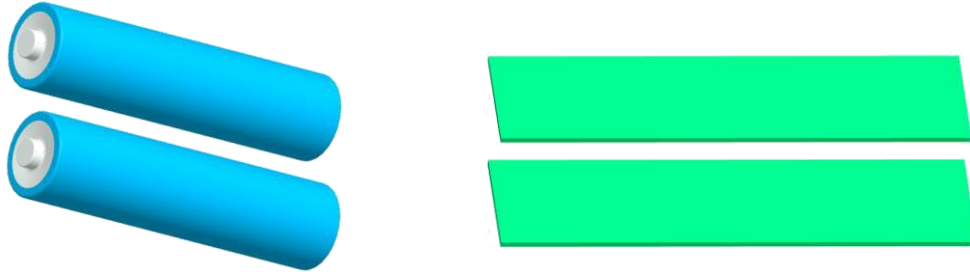


Effect diagram after assembling

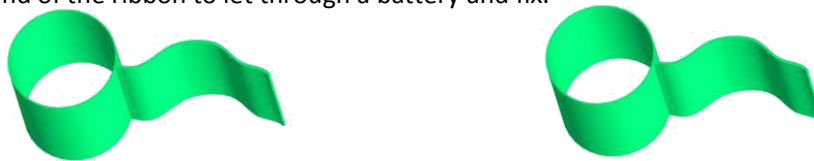


### 1.1.5. Assemble and Remove batteries:

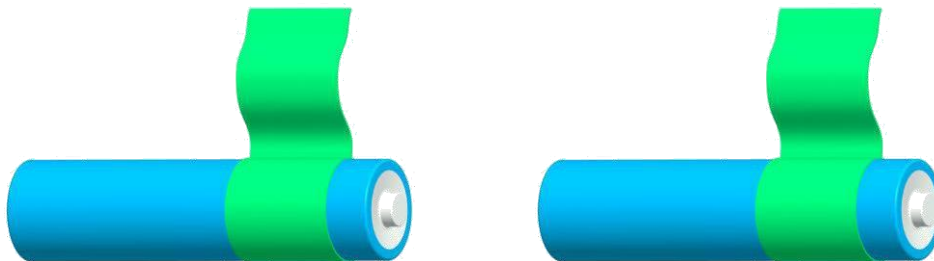
Take out 2 ribbons and 2 batteries.



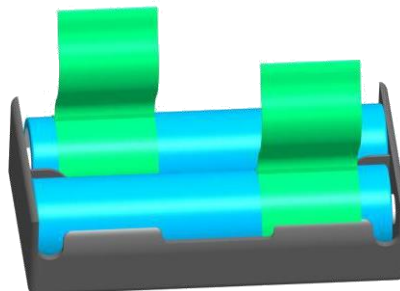
Roll one end of the ribbon to let through a battery and fix.



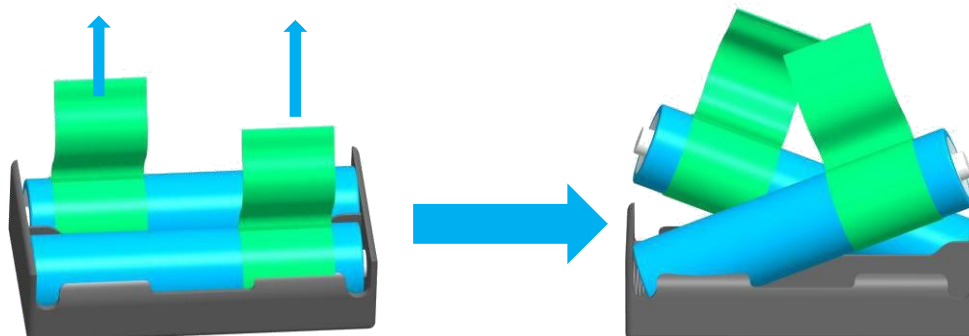
Insert the batteries into the rings-ribbon closer to the anode.



Install the batteries into the holder based on the pole.



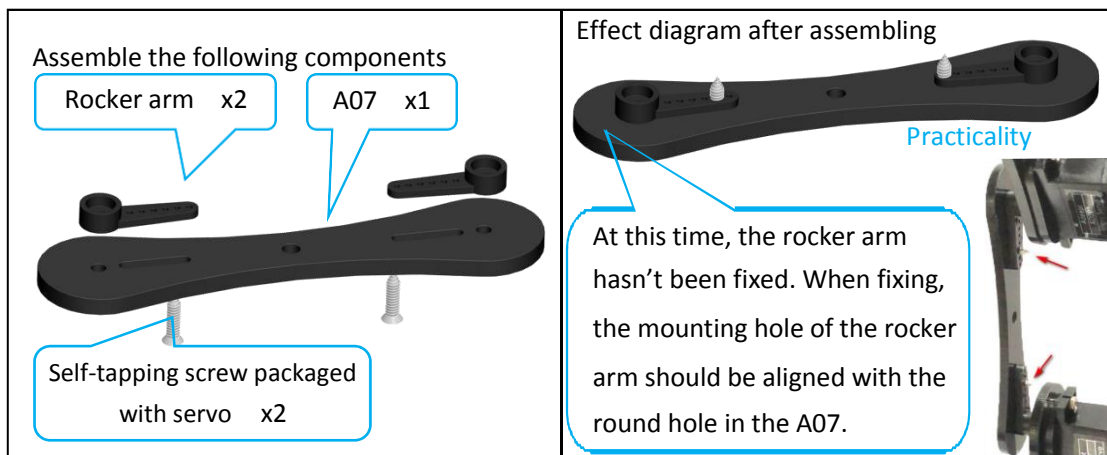
To remove the batteries, just pull the ribbon and take them out.



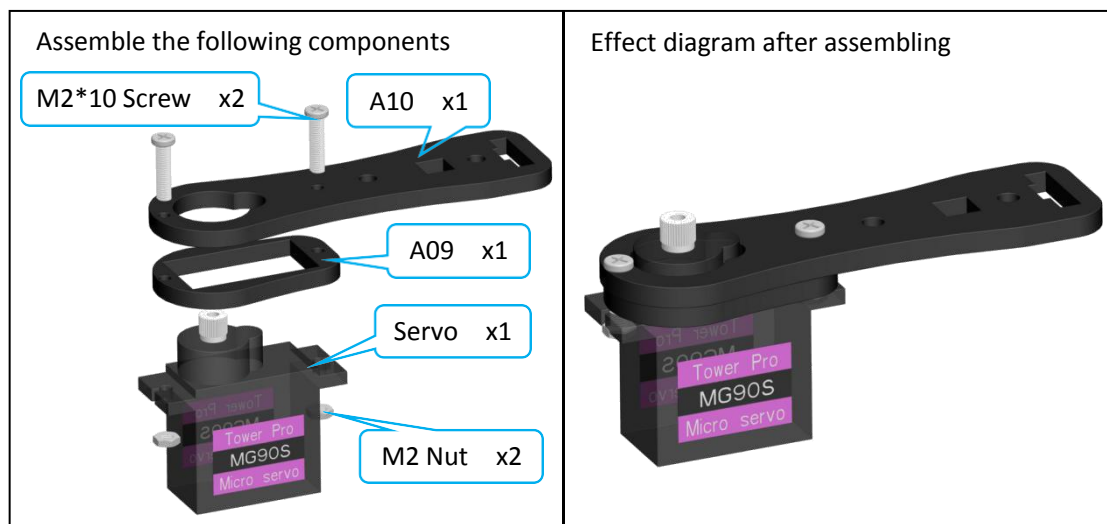
## 1.2. Assembly of Rocker Arm

### 1.2.1. Assemble the steering gear driving rocker arm

1. Take two rocker arms as in the illustration and connect them to A07.

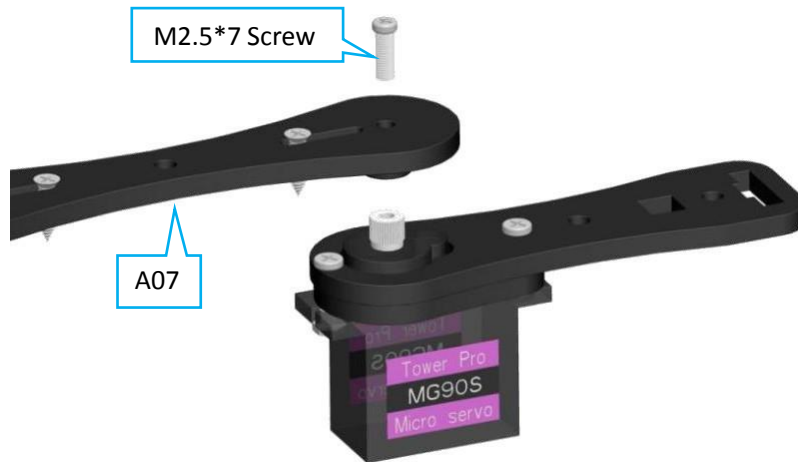


2. Fix a servo to A10.



3. Then fix the other end of the A07 to the servo on the A10.

Assemble the following components



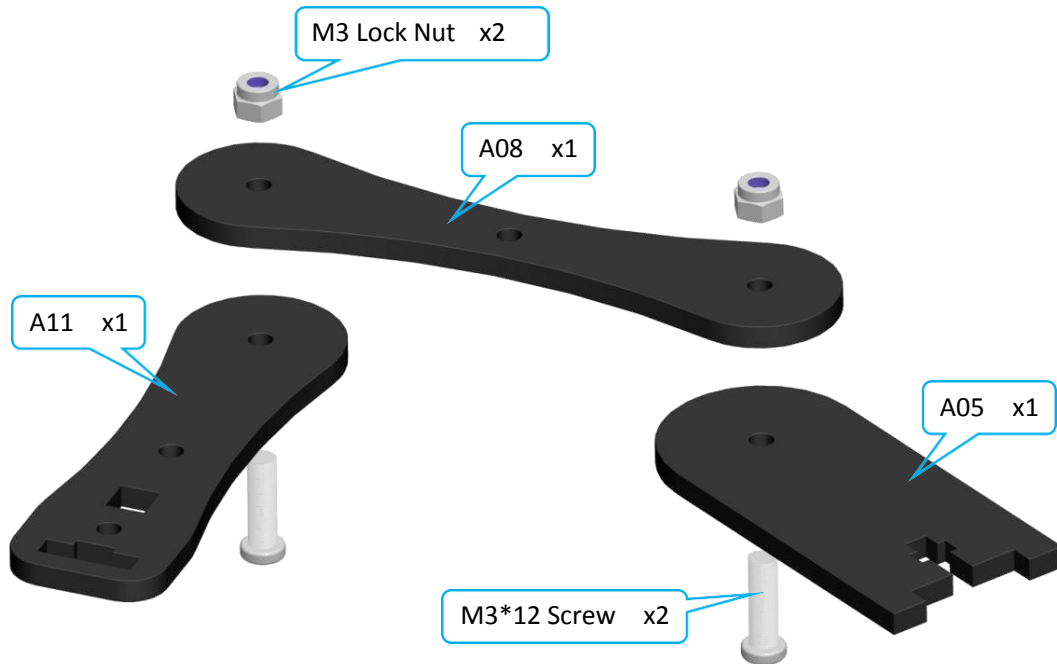
Effect diagram after assembling



## 1.2.2. Assemble the driven rocker arm

1. Connect A05 with A08 and A11.

Assemble the following components



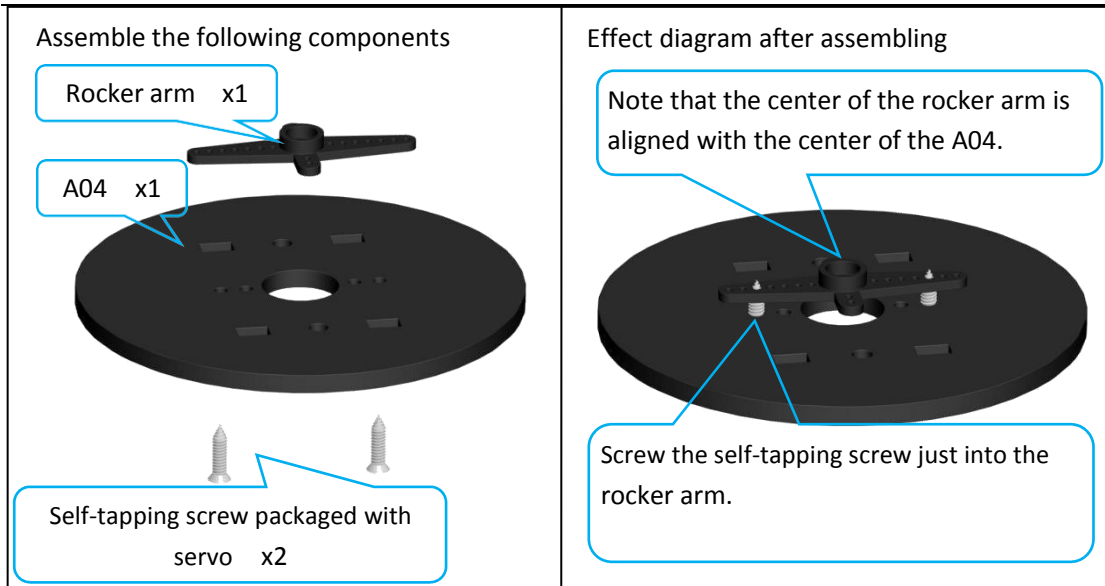
Do not tighten between M3 Lock Nut and M3\*12 Screw. Allow rotation between A05 and A08, also A08 and A11.

Effect diagram after assembling

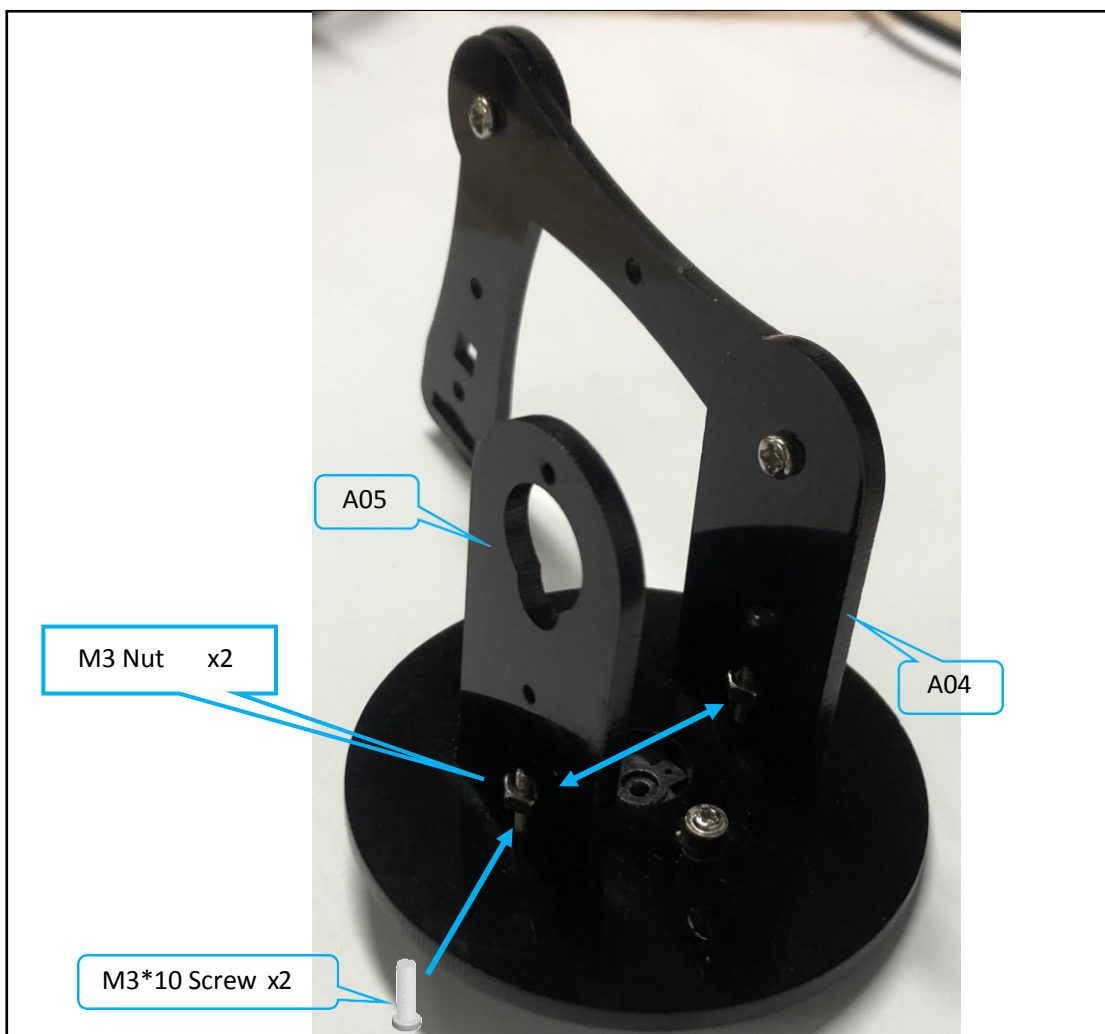


### 1.2.3. Assemble the upper cover A04 of the rotary table and fix A05, A06 parts on both sides of the rocker arm on it.

1. Take a rocker arm as in the illustration and connect it to A04.



2. Fix the A05 and A06 parts on both sides of the rocker arm to the upper cover A04.





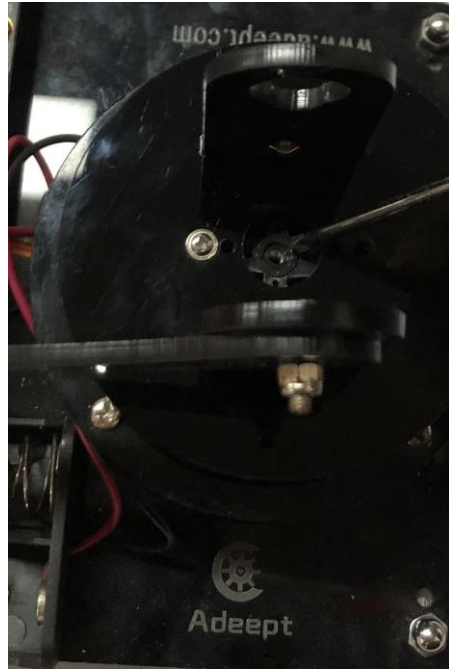
Then screw out a self-tapping screw



## **1.3 Connection and assembly of the Pedestal and Rocker Arm**

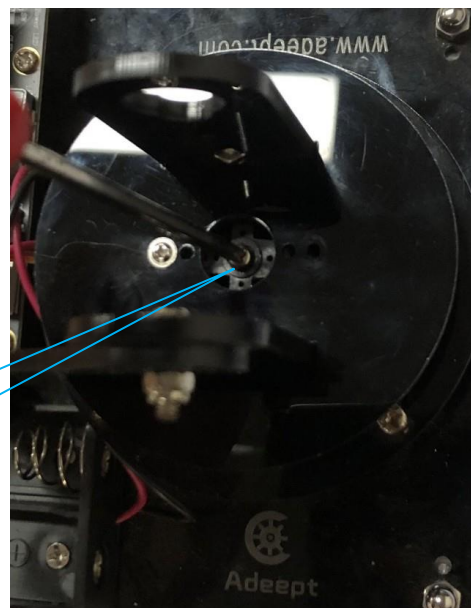
**1.3.1. Assemble the rocker arm components assembled in 1.2.3 to the turntable of pedestals.**

Press the steering wheel on the rotary table into the anti-slip teeth of servo steering gear under the rotary table with Cross-head Screwdriver

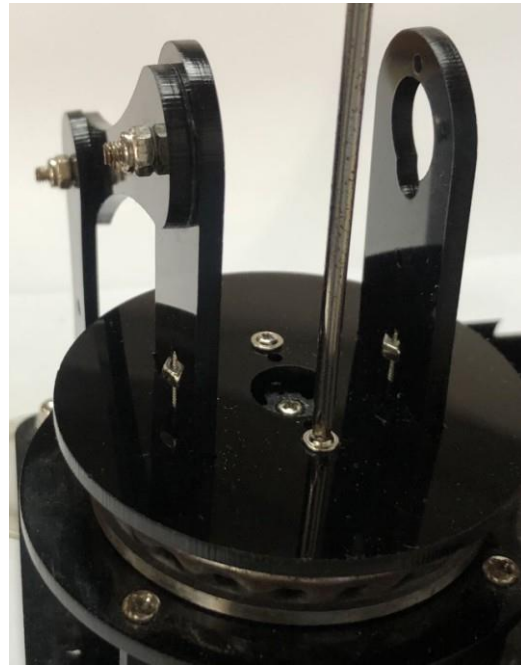


Fix the steering wheel screw of the servo steering gear to the anti-skid teeth of servo under the rotary table with Cross-head Screwdriver

"M2.5 \* 4" screw in servo steering gear package

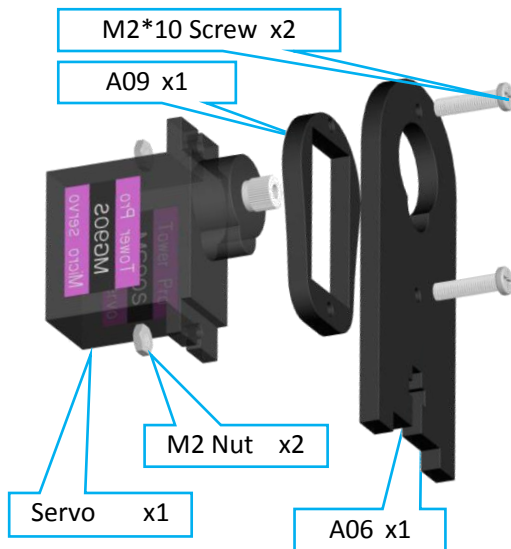


Screw the self-tapping screw just into the rocker arm.  
Then adjust the self-tapping screws on both sides to make the turntable rotate normally, and the structure is stable.

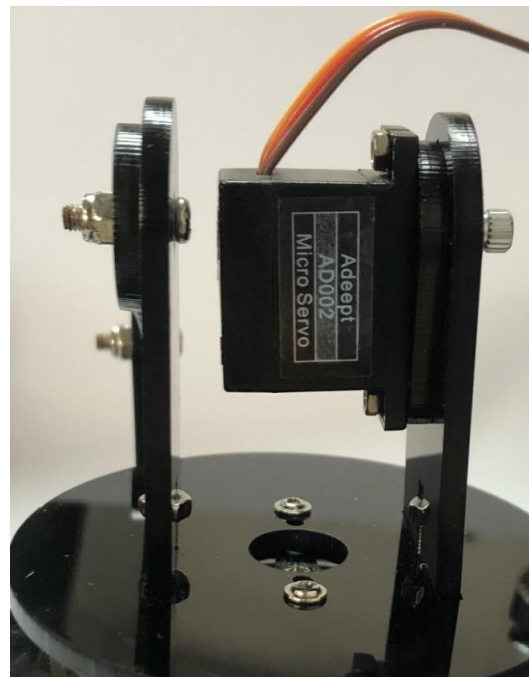


### 1.3.2. Fix a servo to A06.

Fix a servo to A06



Effect diagram after assembling



### 1.3.3. Connect and assemble the parts assembled in 1.2.1.

Fix the other end of part A07 assembled in 1.2.1 to the anti-skid teeth of A06 steering gear (the fixing method is the same as above)

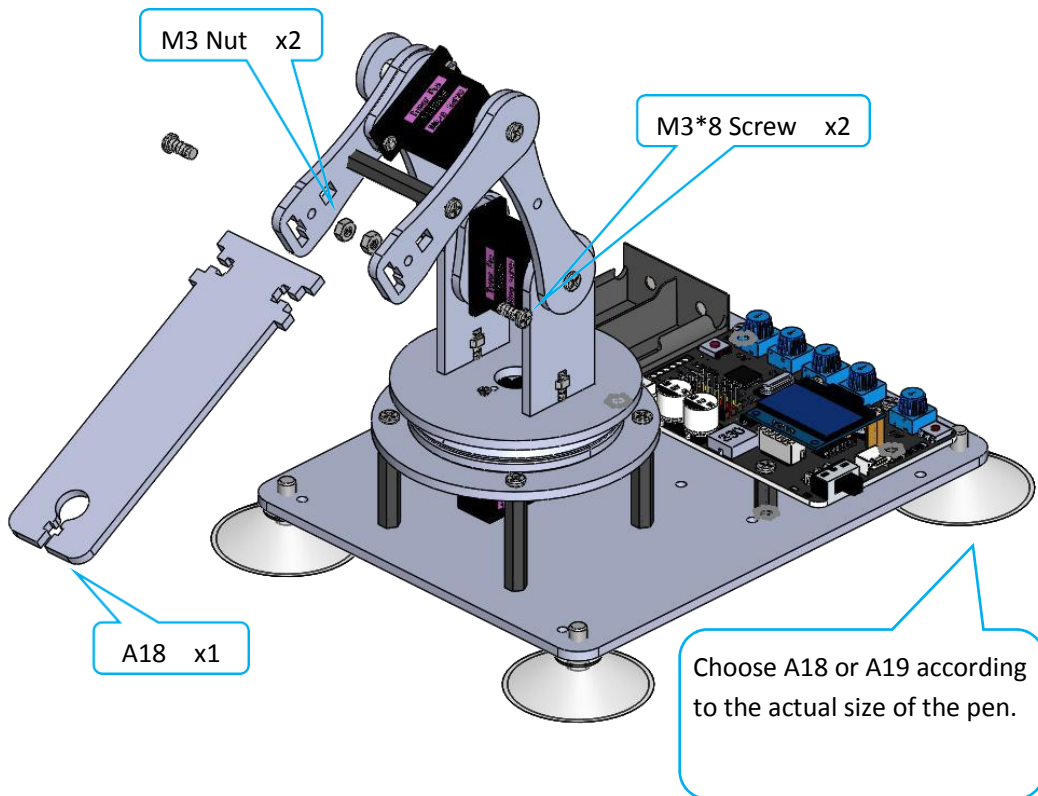
M2.5\*7 Screw x1



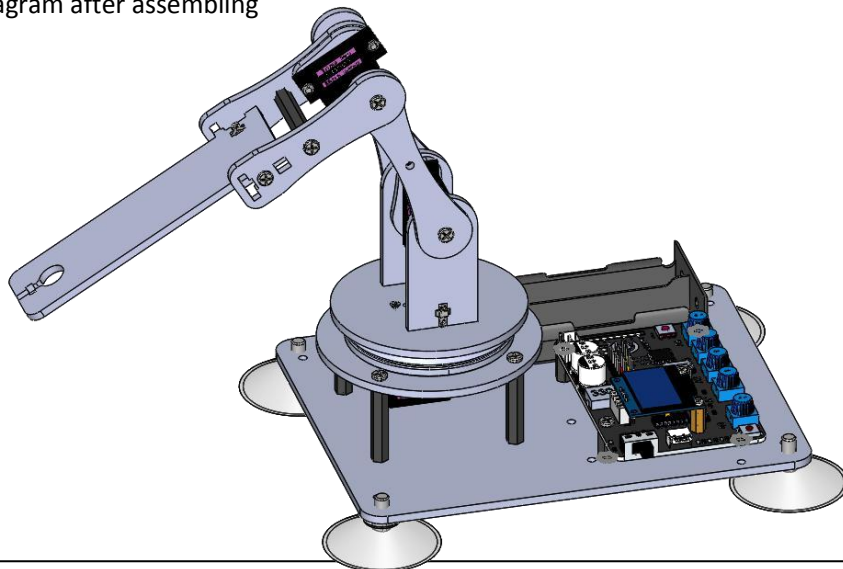
## 2. Play 1

Fix A18 between A10 and A11.

Assemble the following components

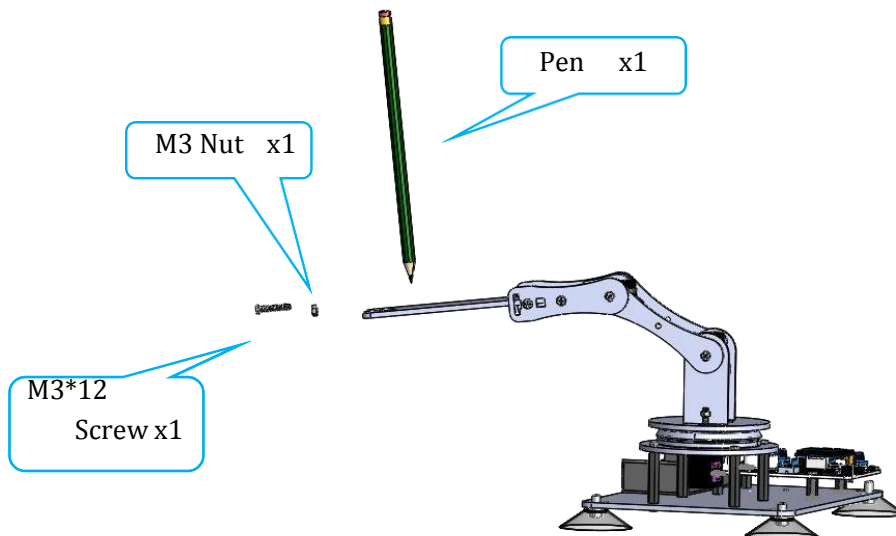


Effect diagram after assembling

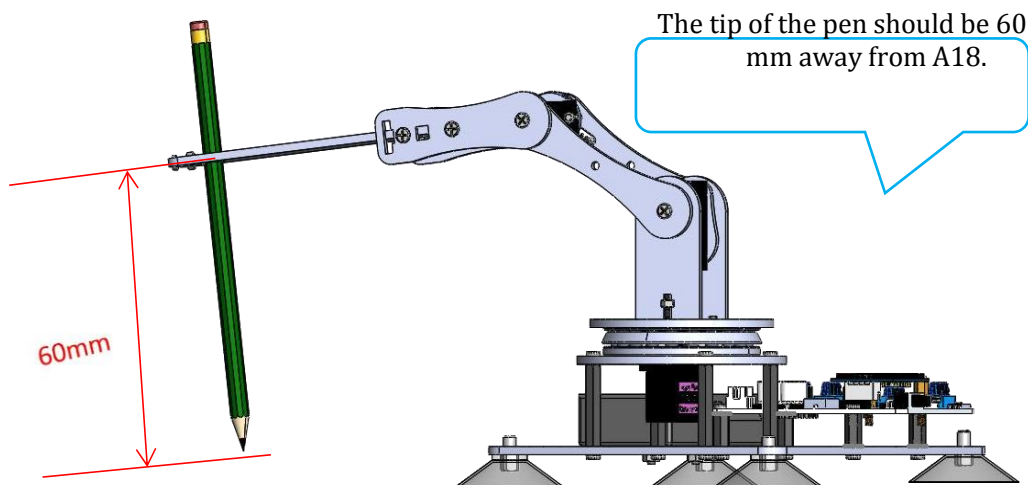
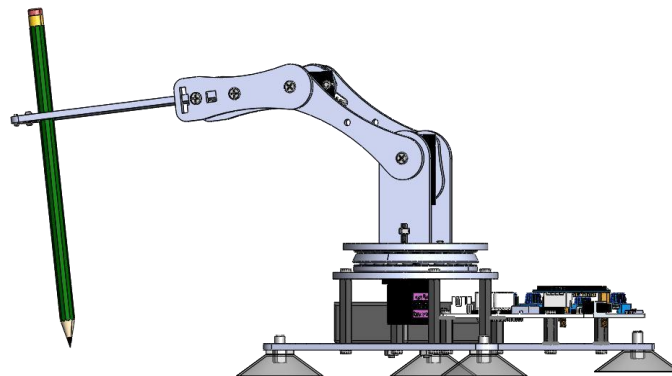


Fix the pen with A18.

Assemble the following components

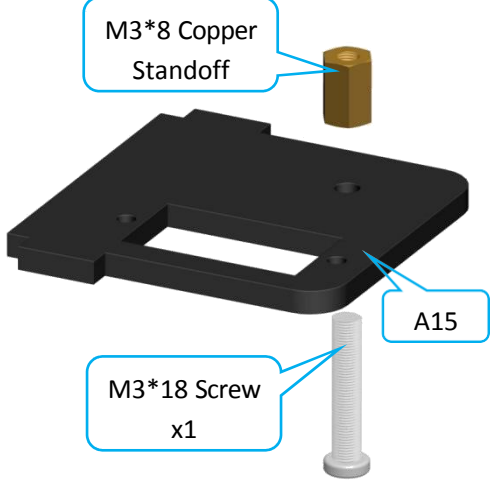
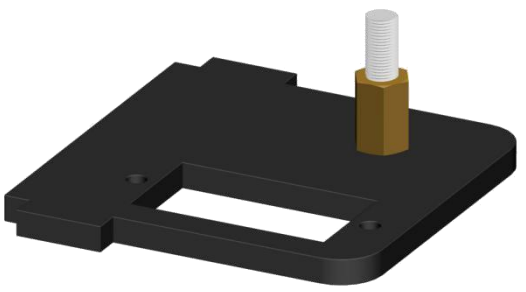


Effect diagram after assembling

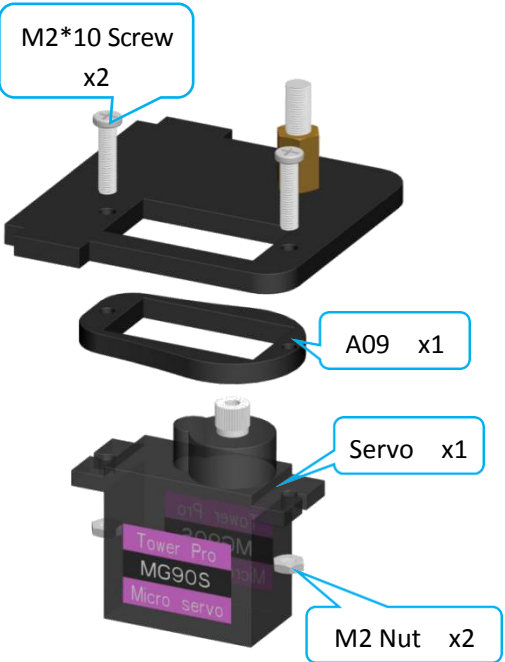



### 3. Play 2

#### 1. Fix one M3\*8 Copper Standoff to A15.

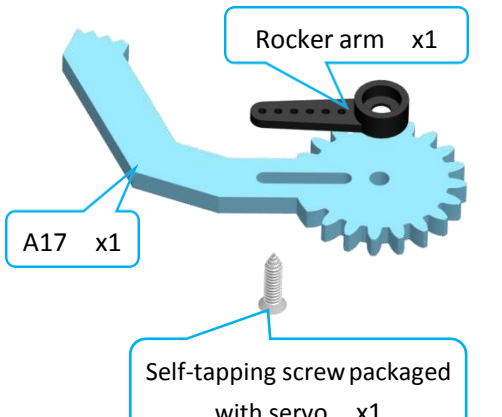
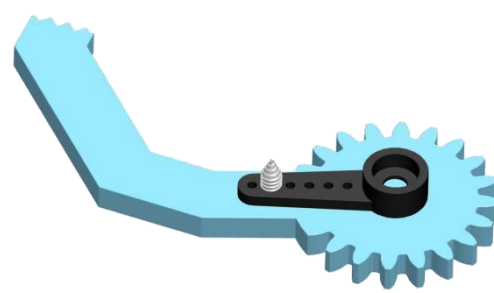
<p>Assemble the following components</p>  <p>M3*8 Copper Standoff</p> <p>M3*18 Screw x1</p> <p>A15</p>	<p>Effect diagram after assembling</p>  <p>Install it in strict accordance with the position shown in the figure. Do not mount the M3*8 Copper Standoff on the other side of the A15.</p>
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#### 2. Fix a debugged servo to A15.

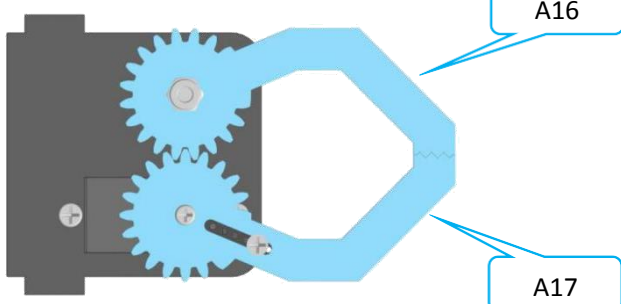
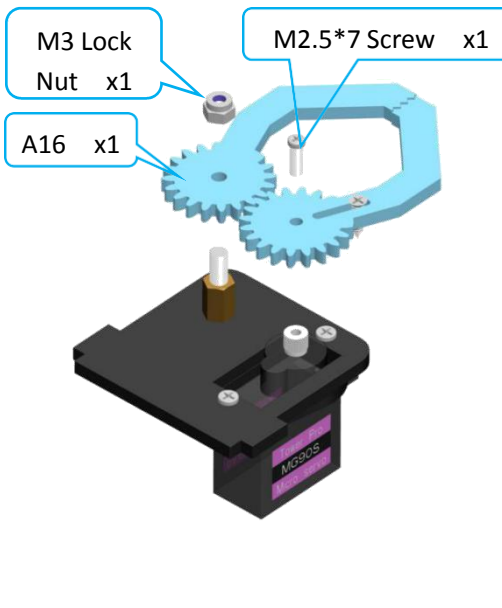

<p>Assemble the following components</p>  <p>M2*10 Screw x2</p> <p>A09 x1</p> <p>Servo x1</p> <p>M2 Nut x2</p>	<p>Effect diagram after assembling</p> 
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3. Fix one rocker arm of the servo to A17.

<p>Assemble the following components</p>  <p>Rocker arm x1</p> <p>A17 x1</p> <p>Self-tapping screw packaged with servo x1</p>	<p>Effect diagram after assembling</p> 
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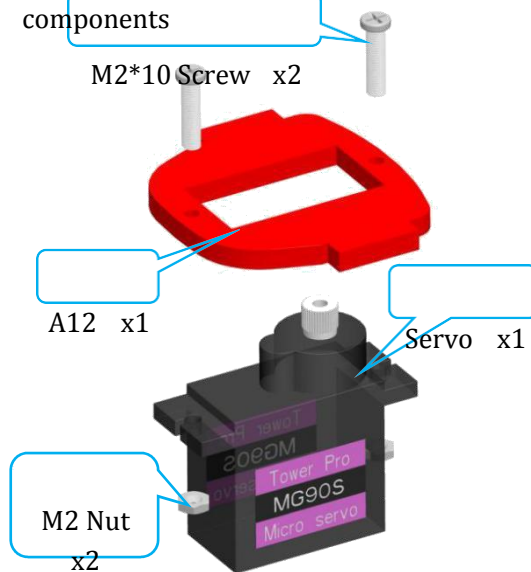
4. Assemble A16 and A17.

<p>Install A16 and A17 as shown below.</p>  <p>A16</p> <p>A17</p>	
<p>Assemble the following components</p>  <p>M3 Lock Nut x1</p> <p>M2.5*7 Screw x1</p> <p>A16 x1</p>	<p>Effect diagram after assembling</p>  <p>Do not tighten the M3 Lock Nut to ensure that the A16 can rotate.</p>



5. Fix a debugged servo to A12.

Assemble the following components

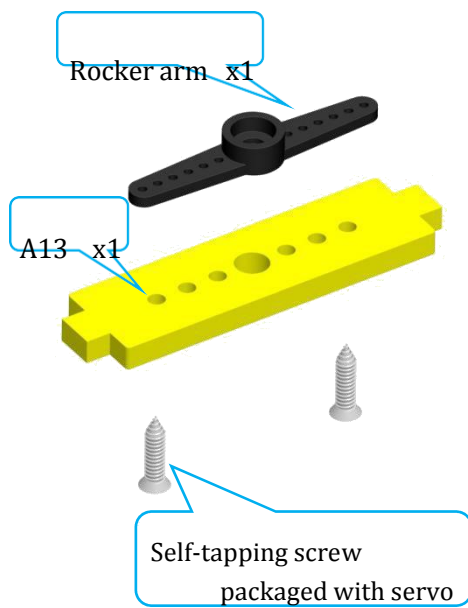


Effect diagram after assembling

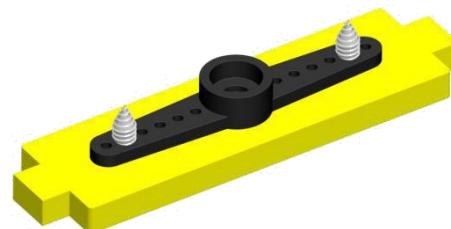


6. Fix a rocker arm to A13.

Assemble the following components



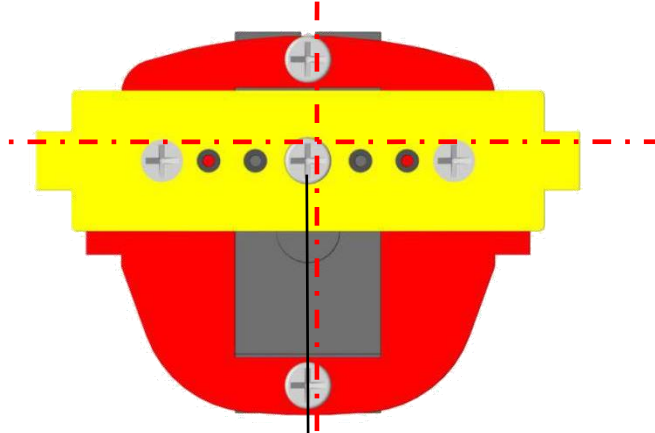
Effect diagram after assembling



x2

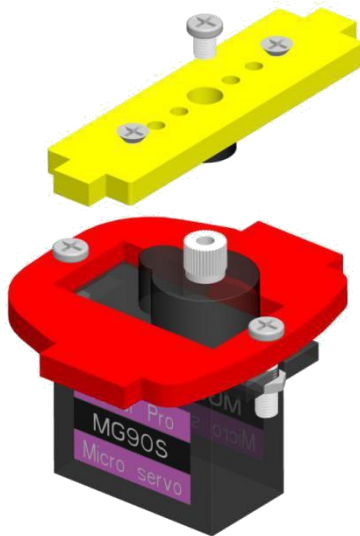
7. Fix the rocker arm on the A13 to the servo on the A12.

Install as shown below.

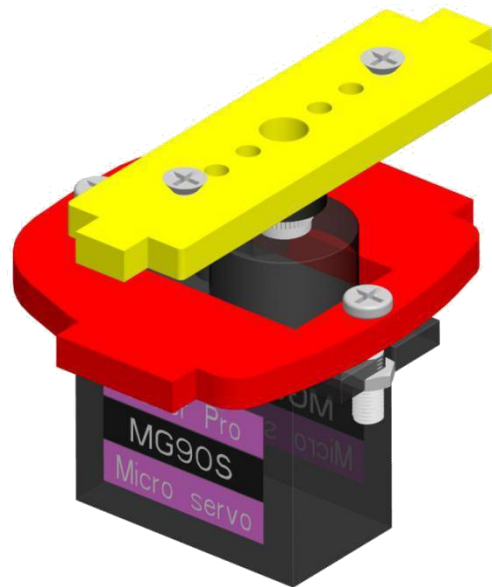


Assemble the following components

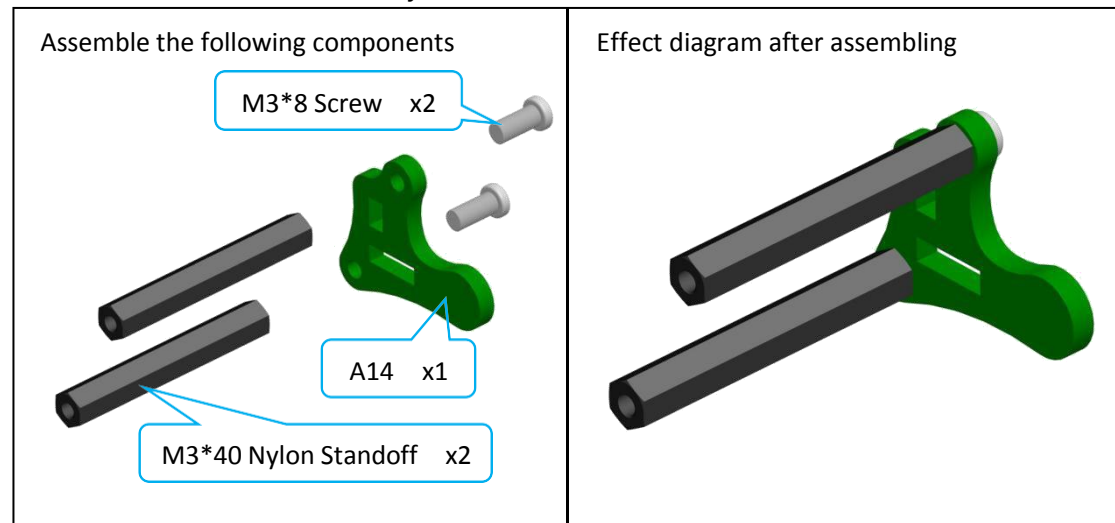
Fixing screw packaged  
with servo x1



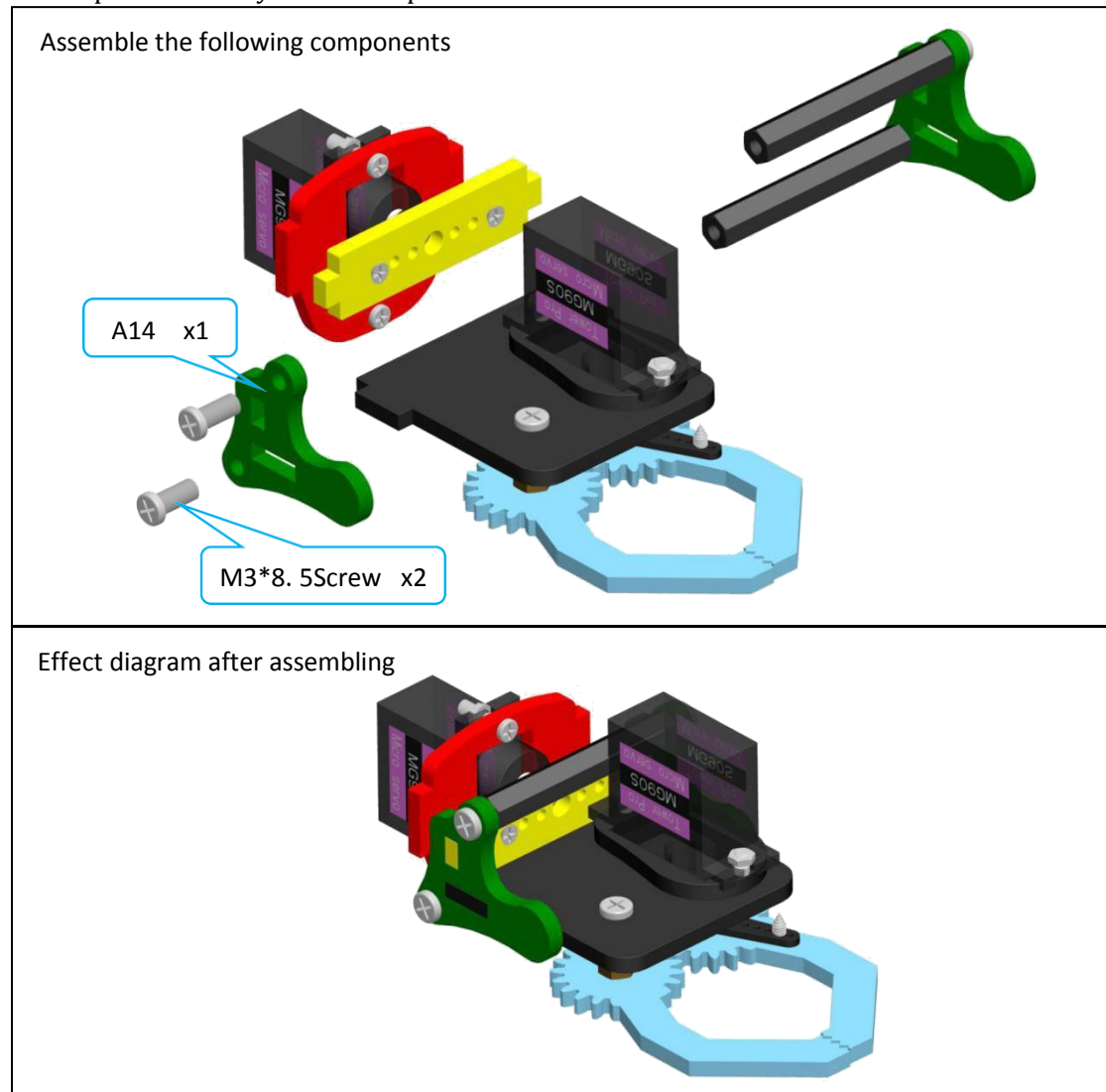
Effect diagram after assembling



8. Fix one A14 with two M3\*40 Nylon Standoffs.

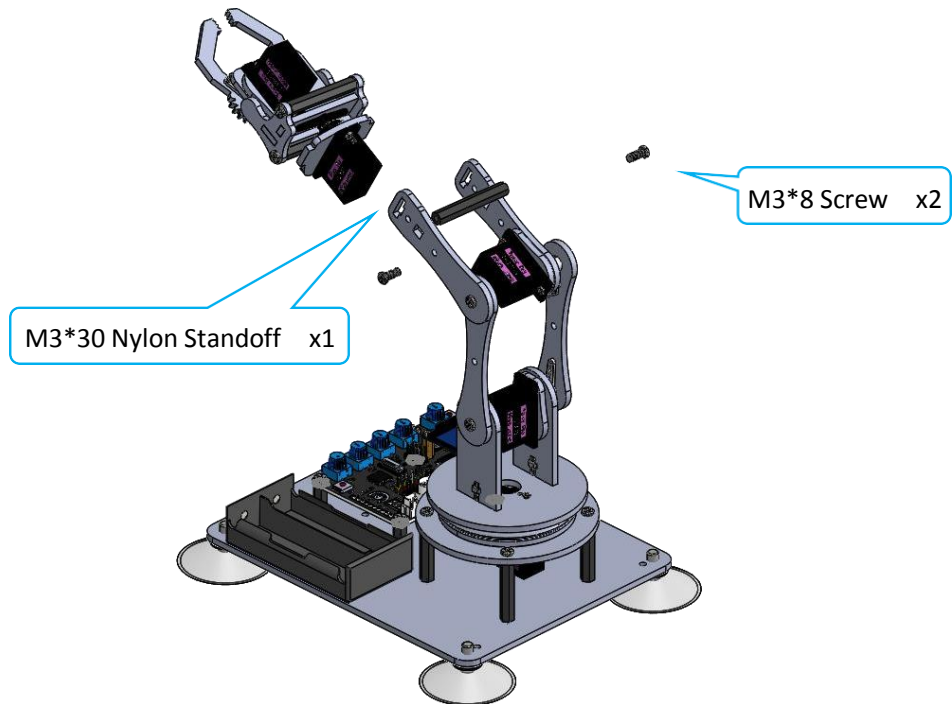


9. Complete assembly of the clamp section.

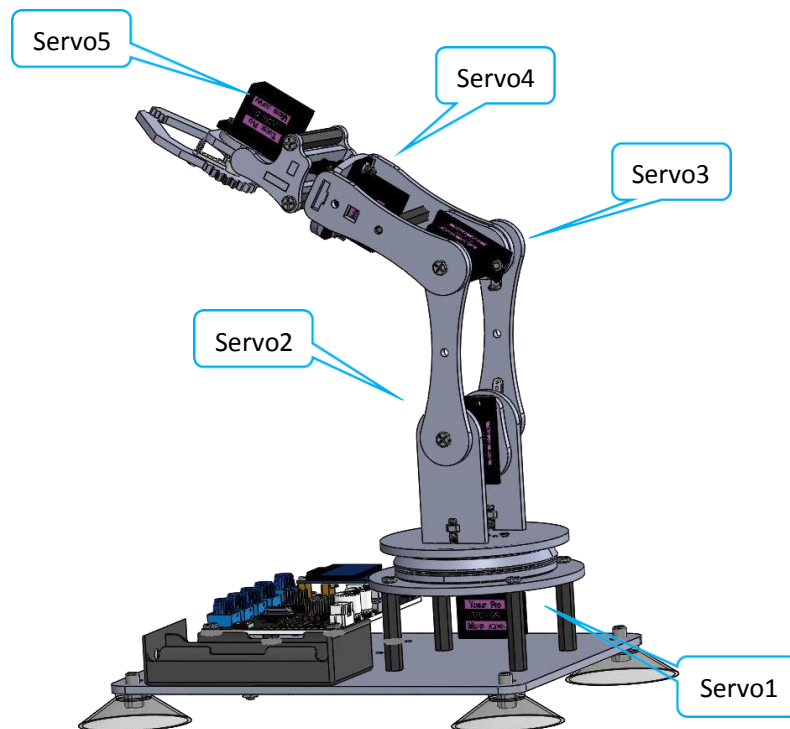


10. Install the clamp section on the robotic arm.

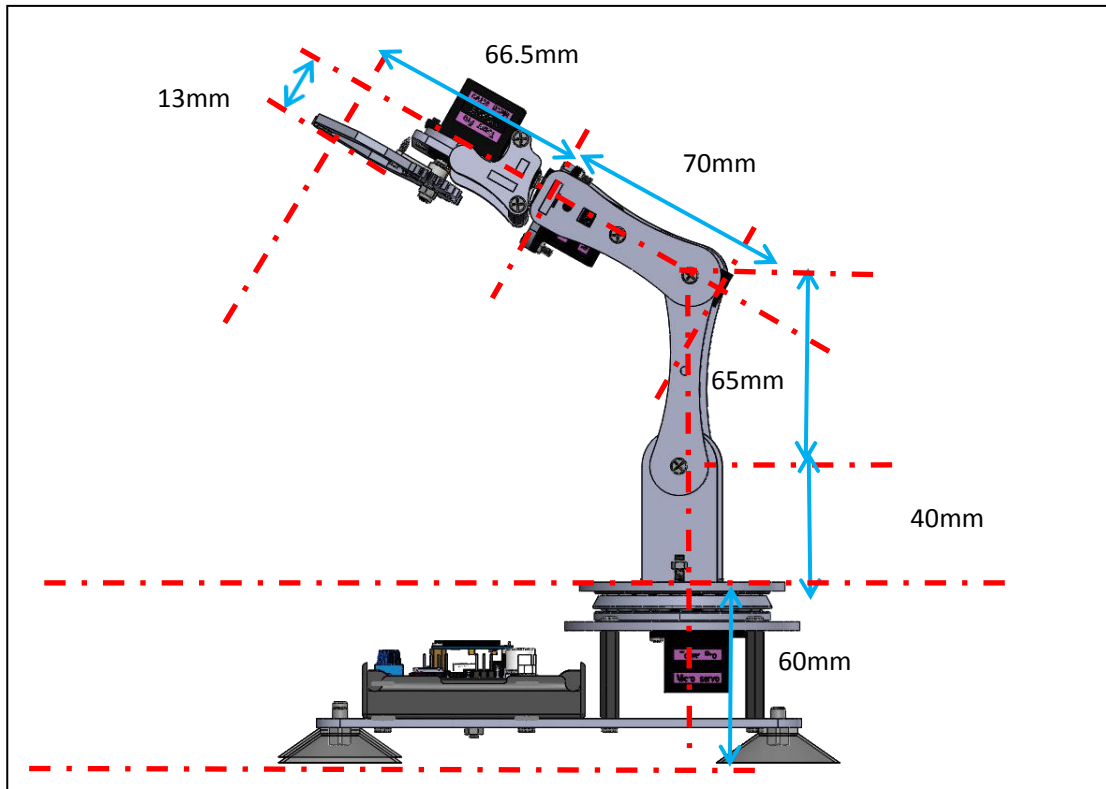
Assemble the following components



Effect diagram after assembling

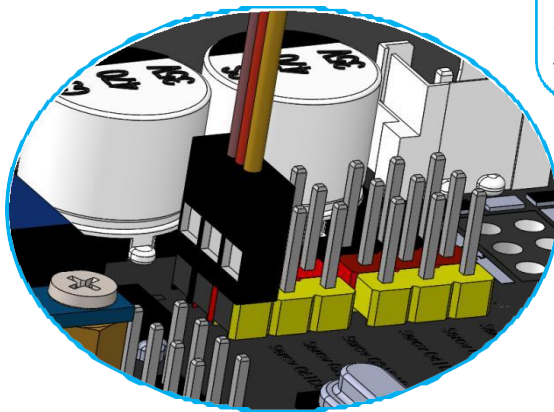


Number each servo to prepare for the circuit connection.

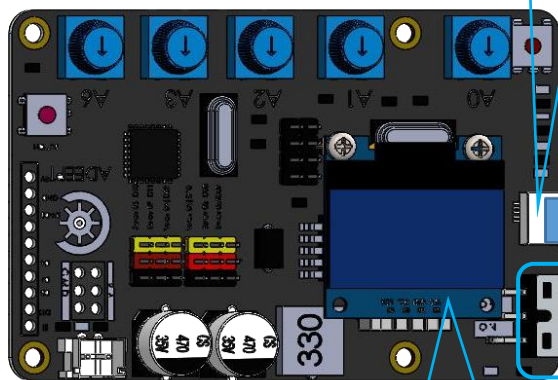


## 4. Circuit Connection

Connection of each devices for the robotic arm:



Insert the servo numbered in the last step into the port here correspondently. The color of the three power cables of the servo corresponds to the port color (as shown on the left).



OLED

18650x1 Battery Holder

## 5. Combinations of the robotic arm

Assemble method (except the front part of the robotic arm).



## 6. Adjustment of the robot arm

Before starting to exert the function, we need to test whether there are problems with the assembly of the robotic arm. When you connect all the servos mounted on the robot arm to the Adept Arm Drive Board correctly and turn on the power switch (using battery power), the attitude of the robot arm is perpendicular to the ground as follows ((it may not be able to achieve the effect shown in the

picture when powered on, a little error is allowed to exist).



**【If your robot arm is assembled and turned on, it is not what it looks like in the picture above, then how do you adjust it? 】**

- i. First, you need to re-download the code used in lesson 5: Servo90.ino. Observe
- ii. if the robot arm is close to the one in the picture above.
- iii. If it does not work, then you need to manually disassemble the robot arm for adjustment, is to operate with the power on, generally you just need to manually adjust the A07 section in the figure below, remove it, and then connect the upper and lower sections of the robot arm vertical ground, and then install the A07 on to fix them.



