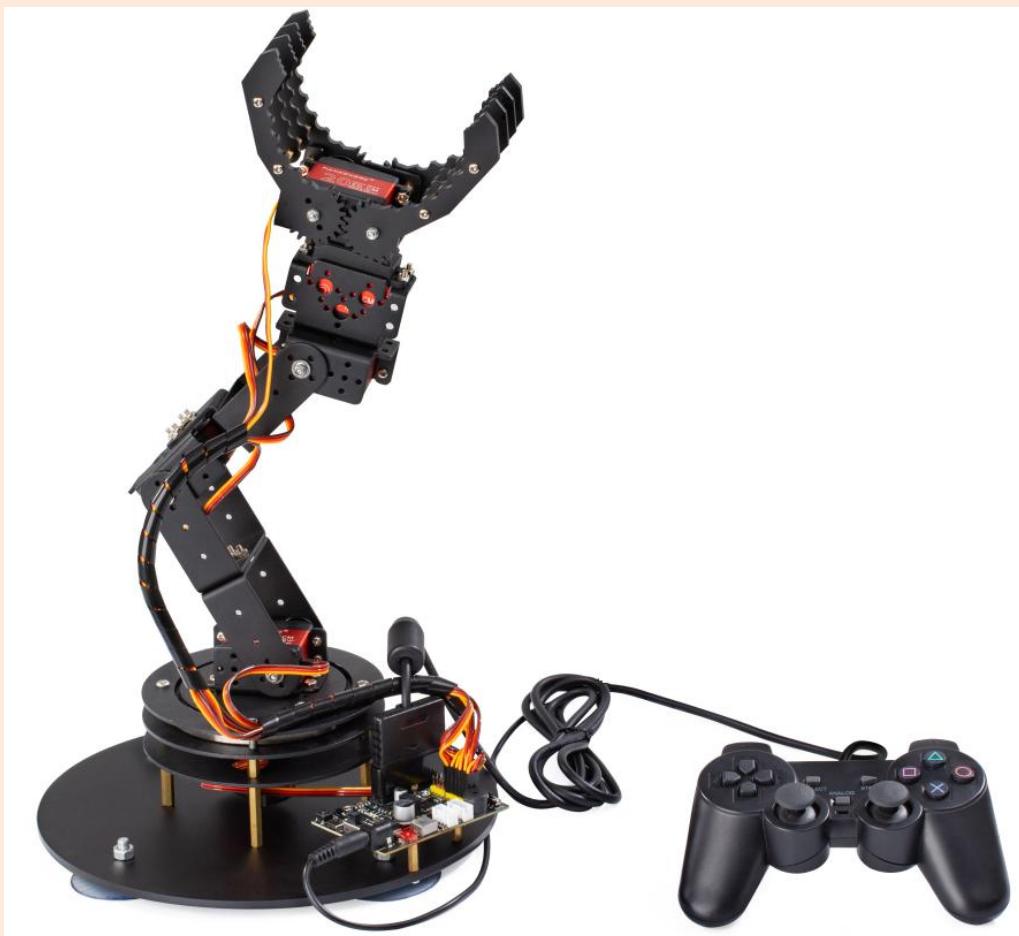


# Lesson 6 How to Assemble the 6DOF Metal Robot Arm

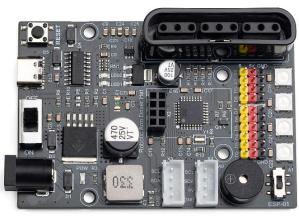
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# 1. What's in the package

## 1.1 Electronic module

Picture	Category	Name	Quantity
	Control Board	Robotic Arm Driver Hat	1

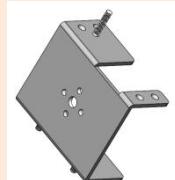
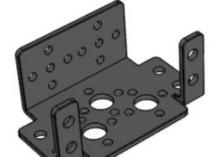
2

## 1.2 Parts used to connect or fix

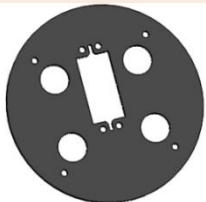
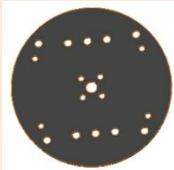
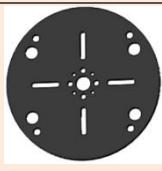
Picture	Category	Name	Quantity
	Countersunk screw	KM3*12MM	5
	Screw	Nut M3	50
	Screw	M3*6MM round head screw	35
	Nut	M3 self-locking nut	10

3

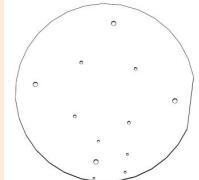
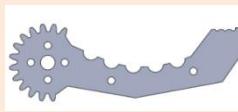
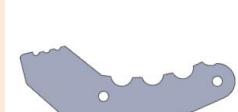
	Screw	Nut M4	10
	Screw	M3*8MM round head screw	58
	Screw	M4*20MM round head screw	6
	Screw	M4*10MM round head screw	10
	Screw	M4*35MM round head screw	6
	Copper column	M3*17mm double-pass copper column	9
	Copper column	M3*11mm+6mm single-pass copper column	5
	Copper column	M3*15mm+6mm single-pass copper column	9

	Copper column	M4*13 double-pass copper column	5
	Copper column	M4*35 double-pass copper column	5
	holder	Claw U-shaped holder	1
	holder	Multi functional holder	4
	holder	U-shaped holder	3
	holder	L-shaped holder	1
	Metal disk	Circular outer ring	2

5

	Metal disk	Disk base	1
	Metal disk	Inner circle on the disc	1
	Metal disk	Inner circle under the disc	1
	Servo Panel	Metal Servo Panel T25	6
	Flange bearing	F693ZZ φ3*8*4 bearing	3
	bearing	F619/3Z bearing	1
	Base bearing	6815ZZ bearing 75*95*10MM	1

	Servo	25kg metal servo motor DC6-8.4V 180 ° without mechanical limit	1
	Servo	20kg metal servo motor DC6-8.4V 180 ° without mechanical limit	5
	Adapter	9V/3A power adapter DC head (US standard)	1
	PS2 controller	PS2 control handle (wired black)	1
	Sucker	Sucker (M6 screw, suction surface diameter 52mm)	4
	wrapped tube	φ8Black wrapped tube 10CM	2
	Usb cable	type-C usb cable (5V/2A white)	1

	Acrylic	Acrylic base (diameter 240mm)	1
	Acrylic	Acrylic structural component 1	1
	Acrylic	Acrylic structural component 2	2
	Acrylic	Acrylic structural component 3	4
	Acrylic	Acrylic structural component 4	1

### 1.3 Tool

Picture	Category	Name	Quantity
	wrench	M3 simple wrench	1
	sleeve	Cross-Shaft Sleeve	1

	screwdriver	M3 Phillips screwdriver	1
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8

## 2. Precautions for assembly

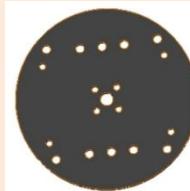
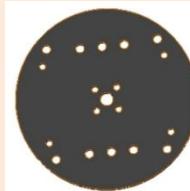
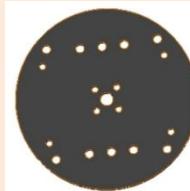
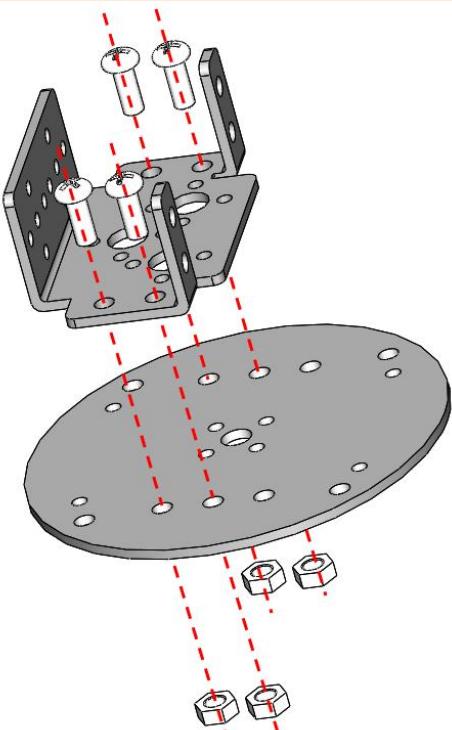
- 2.1 Before assembly, adjust all 6 servos to a 90 degree position.
- 2.2 You cannot turn the servo shaft until you have completed this fixing step, otherwise you will need to re-set them to 90 degree using the code “[4\\_2\\_servo\\_90\\_Adjust](#)”
- 2.3 Use a screwdriver or other tool to remove the protective film from the acrylic structural components.

## 3. Assembly

### 3.1 Assembly Steps

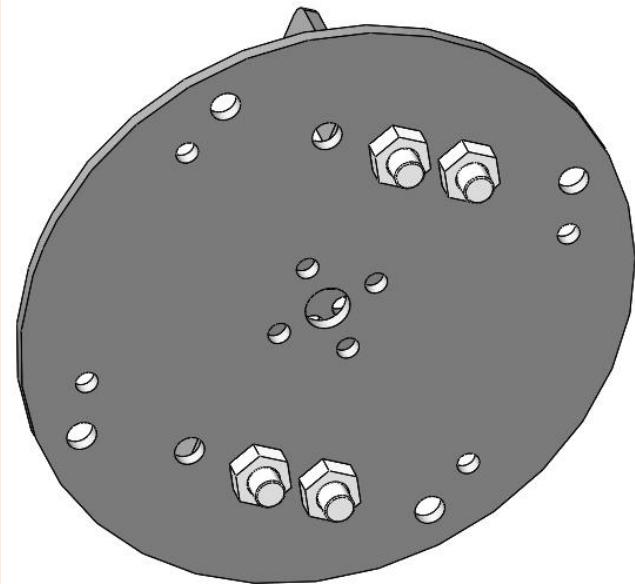
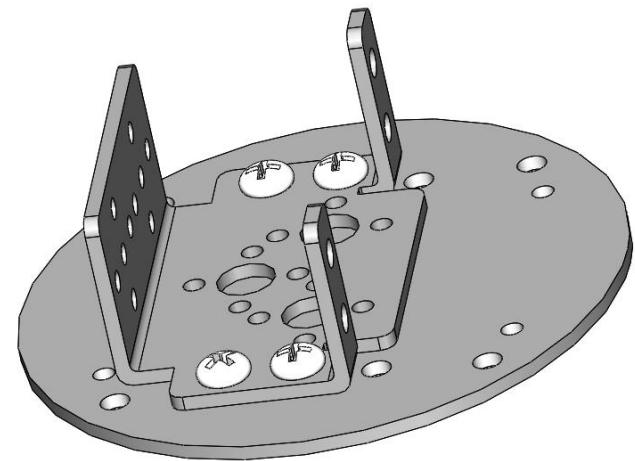
Note: 1. Before assembling, we need to use a screwdriver to peel off the yellow protective paper of the black acrylic board;

Parts	Name	Quantity	Unit	Picture
Step 1	Assemble the multifunctional holder with the Inner circle on the disc	Tool	M3 cross screwdriver	
			Cross-Shaft Sleeve	

<b>List</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">multifunctional holder</td><td style="width: 20%;">1</td><td style="width: 20%;">PCS</td><td style="width: 40%; text-align: center;">  </td></tr> <tr> <td>Inner circle on the disc</td><td>1</td><td>PCS</td><td style="text-align: center;">  </td></tr> <tr> <td>M4 nut</td><td>4</td><td>PCS</td><td style="text-align: center;">  </td></tr> <tr> <td>M4*10mm round head screw</td><td>4</td><td>PCS</td><td style="text-align: center;">  </td></tr> </table>	multifunctional holder	1	PCS		Inner circle on the disc	1	PCS		M4 nut	4	PCS		M4*10mm round head screw	4	PCS	
multifunctional holder	1	PCS															
Inner circle on the disc	1	PCS															
M4 nut	4	PCS															
M4*10mm round head screw	4	PCS															
<b>Detailed steps</b>	<b>Description</b>	<b>Installation Diagram</b>															
	<p>1. Use M4 * 10mm round head screws and M4 nuts to assemble the multifunctional holder onto the Inner circle on the disc;</p> <p><b>Attention:</b></p> <p>1. Assembly direction of multifunctional bracket;          2. The screw assembly holes correspond correctly, refer to the dashed line in the diagram on the right;</p>																

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Step 1 structure(As shown in the figure on the right)



## Step 2

Assemble the base bearing

Tool

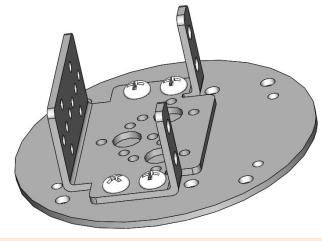
M3 Phillips screwdriver



Cross-Shaft Sleeve



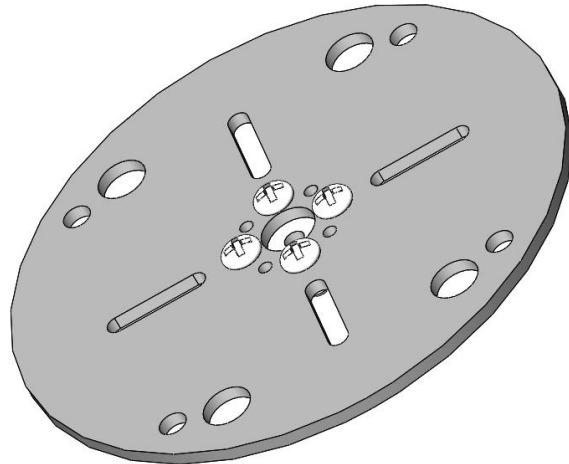
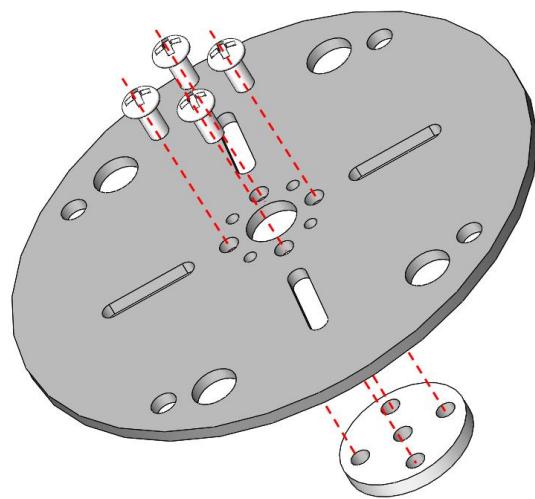
Part	Name	Quantity	Unit	Picture
------	------	----------	------	---------

list	Description	1	PCS		
11	base bearing	1	PCS		
	Inner circle under the disc	1	PCS		
	Servo Panel	1	PCS		
	M4*20mm round head screw	4	PCS		
	M4 nut	4	PCS		
	M3*6mm round head screw	4	PCS		
Detailed steps	Description			Assemble Diagram	

12

1. Use 4pcs M3 \* 6mm round head screws to assemble the servo panel into the Inner circle under the disc;

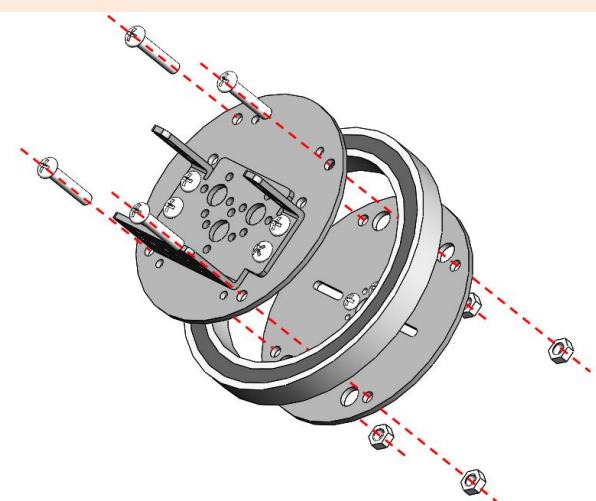
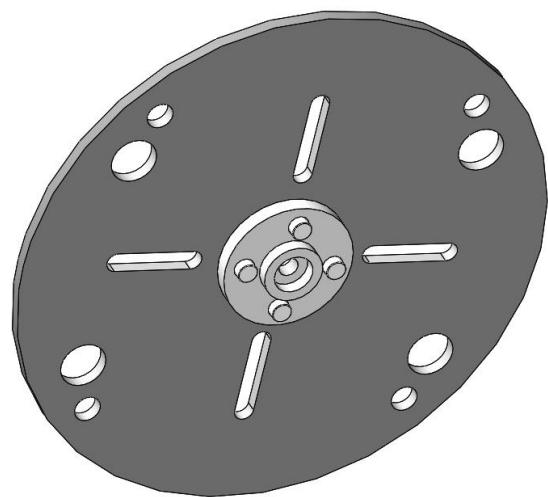
Pay attention to the assembly direction of the servo panel;



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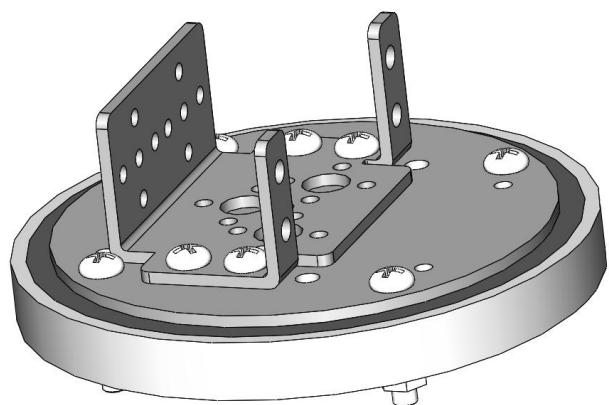
2. Use 4 PCS M4 \* 20mm round head screws to pass through step 1 structure, base bearing and Inner circle under the disc, Then using 4 pcs nuts to tighten, they were assembled to create the Step 2 structure.

**Pay attention to the assembly sequence;**



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Step 2 structure(As shown in the figure on the right)



### Step 3

Assemble the circular outer ring onto the Step2 structure

Tool

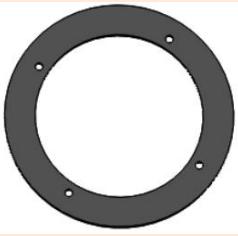
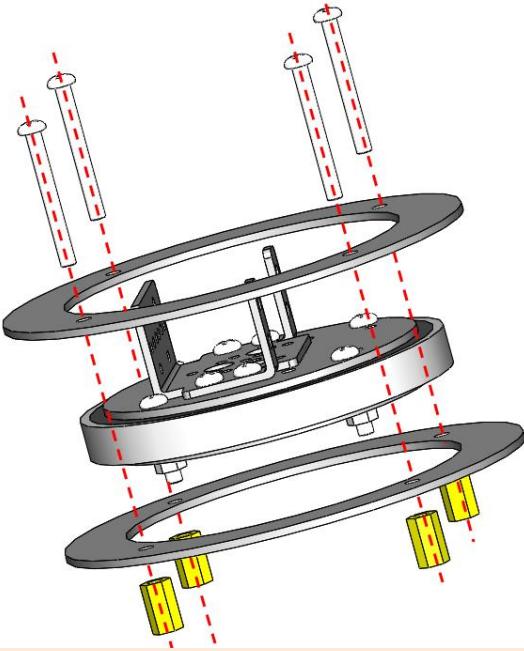
M3 Phillips screwdriver

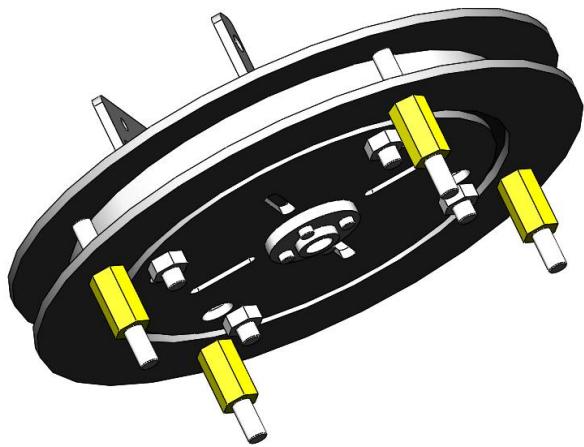
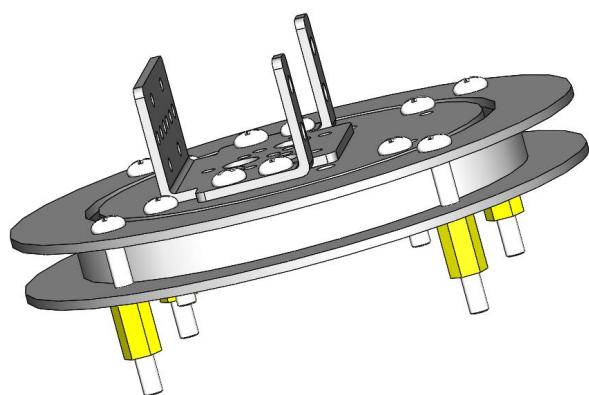


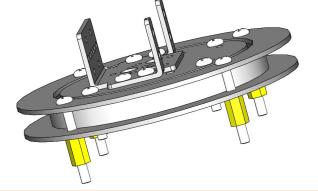
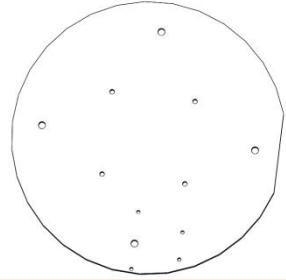
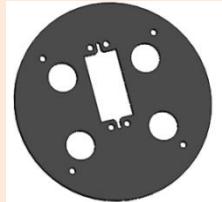
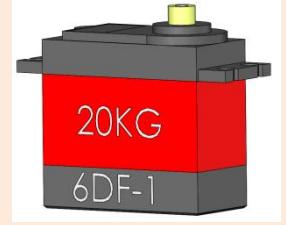
simple wrench

/

Part list	Name	Quantity	Unit	Picture	
	step 2 structure	1	PCS		

15	Circular outer ring	2	PCS	
	M4*35mm round head screw	4	PCS	
	M4 * 13mm double copper column	4	PCS	
Detailed steps	Description		Installation Diagram	
	<p>1. Using 4 PCS of M4 * 35mm round head screws to assemble the Circular outer ring, Step 2 structure, Circular outer ring, and M4 * 13mm copper columns in sequence ;</p> <p>Assembled into the structure of Step 3.</p> <p><b>Pay attention to the assembly sequence;</b></p>			

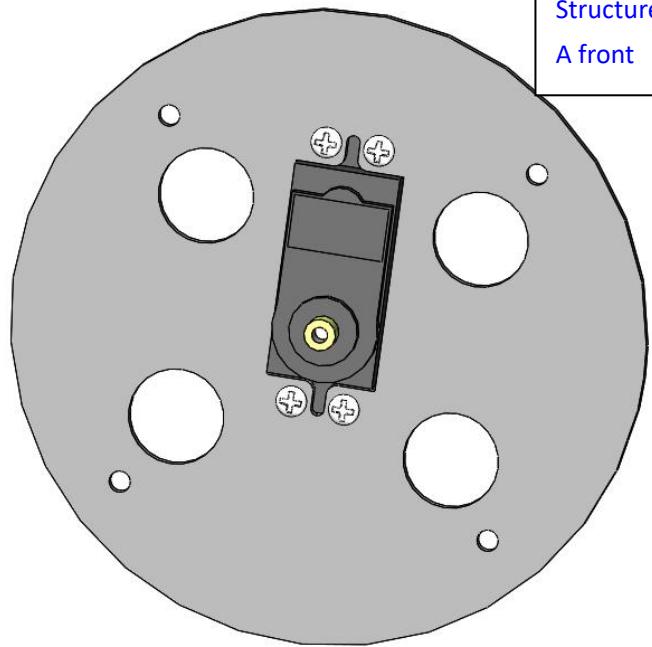


<b>Step 4</b>	Firstly, assemble the 6DF-1 servo and metal disc base together, and then assemble them with the structure of Step 3			<b>Tool</b>	M3 Phillips screwdriver
					
<b>Part list</b>	<b>Name</b>	<b>Quantity</b>	<b>Unit</b>	<b>Picture</b>	
	Step 3 structure	1	PCS		
	Acrylic base (Diameter 240mm)	1	PCS		
	Metal disc base	1	PCS		
	6DF-1 Servo	1	PCS		
	M3 nut	4	PCS		

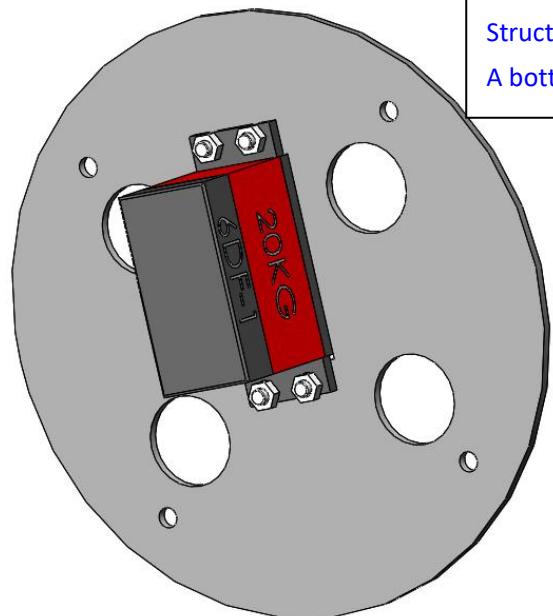
18	M3*8mm round head screw	4	PCS	
	M4*10mm round head screw	4	PCS	
	M4*35mm Double copper column	4	PCS	
<b>Detailed steps</b>	<b>Description</b>		<b>Installation Diagram</b>	
	<p>1. Use 4PCS M3 * 8mm round head screw to assemble the 6DF-1 servo motor onto the metal disc base and tighten it with M3 nuts;          Name it Structure A  <b>Attention:</b> The assembly direction of the 6DF-1 servo is that the servo shaft is located in the center of the metal disc base;</p>			

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Structure A (As shown in the figure  
on the right)



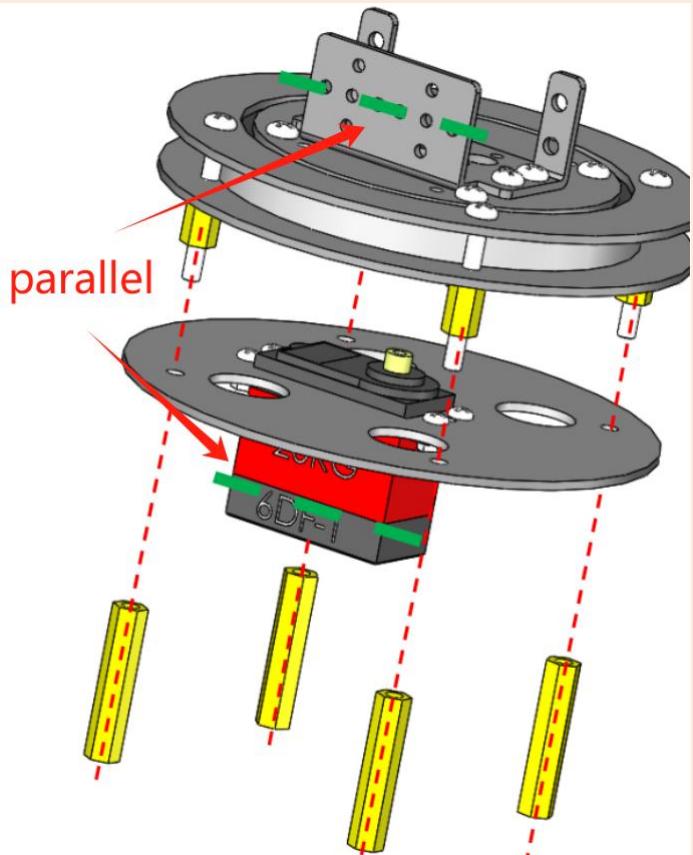
Structure  
A front



Structure  
A bottom

20

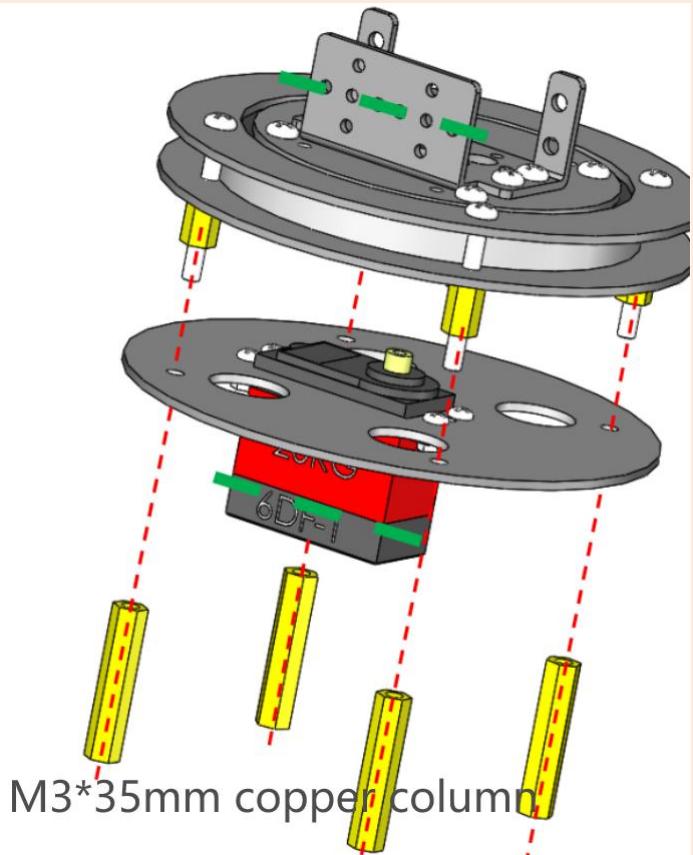
2. Assemble Step 3 Structure and Structure A together;  
**(Note:** The side of the multifunctional holder that stands vertically needs to be assembled parallel to the side with characters on the servo, as indicated by the green dashed line in the right figure)



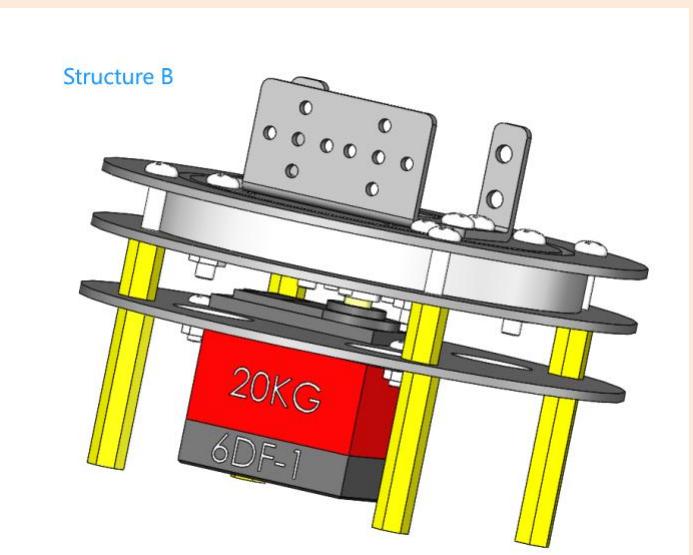
21

3. As shown in the figure on the right, assemble 4pcs M3 \* 35mm double passed copper pillars. First, tighten the two diagonal copper pillars, and then tighten the other two diagonal copper pillars;

Name it Structure B

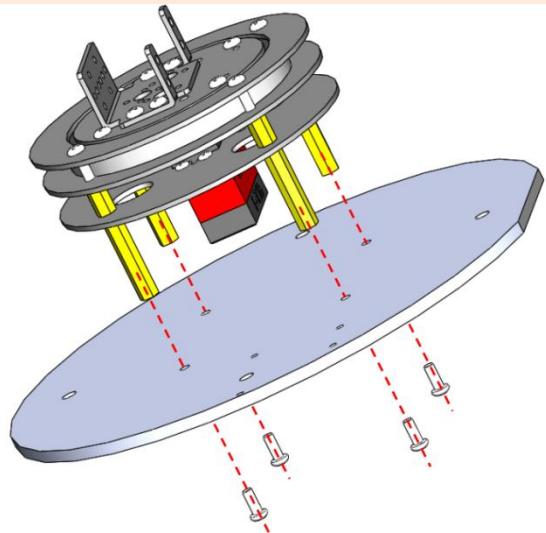


Structure B (As shown in the figure on the right)



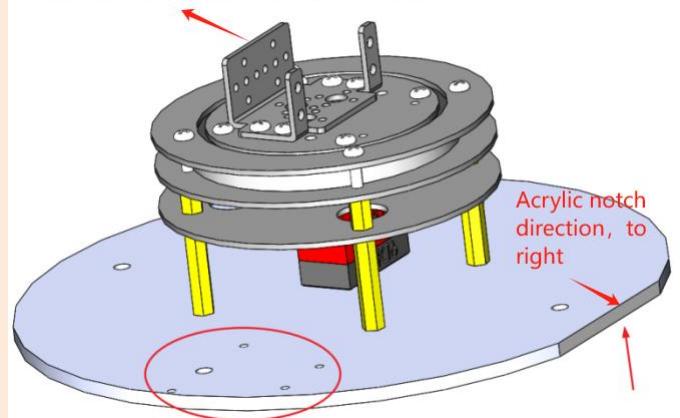
22

4. Use 4pcs M4 \* 10mm round head screws to assemble Structure B with the acrylic base, forming the Step 4 structure.

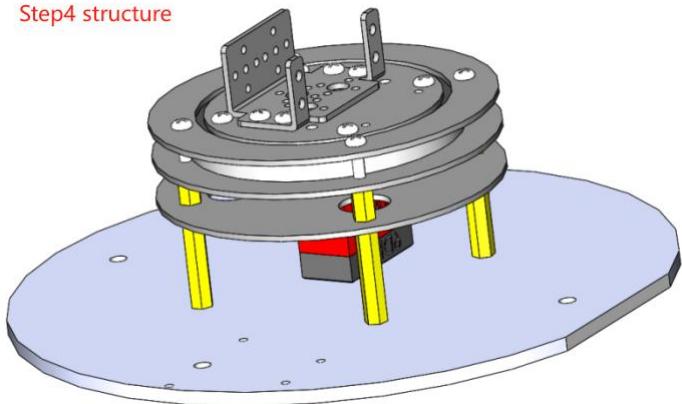
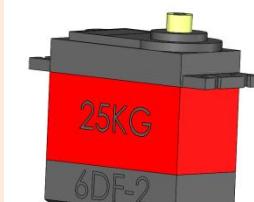


Pay attention to the assembly direction of the acrylic base;

Multi functional holder facing to the left



Step 5		Assemble 6DF-2 servo		Tool	M3 Phillips screwdriver
Part list	Name	Quantity	Unit		simple wrench
					
					

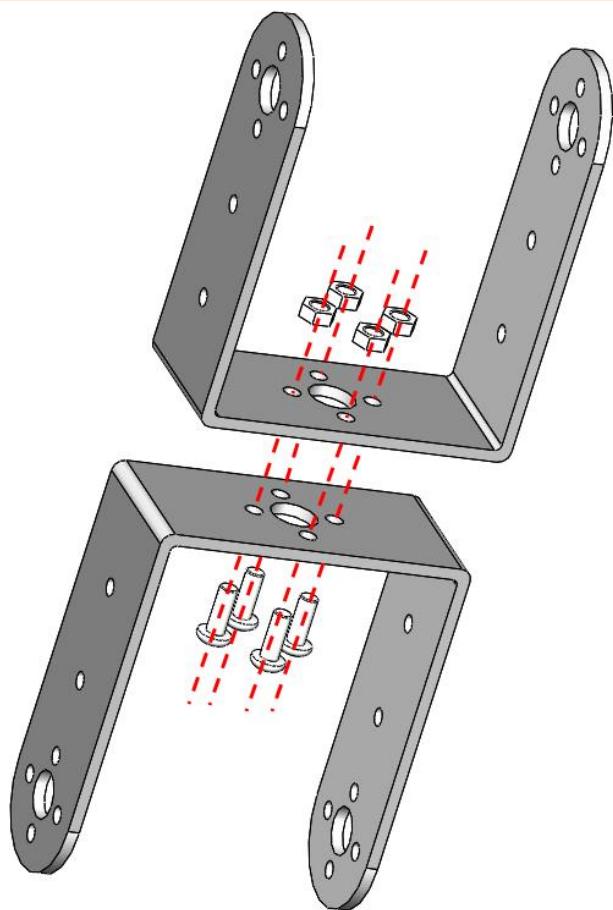
23	step 4 structure	1	PCS	 <b>Step4 structure</b>
	U-shaped holder	2	PCS	
	6DF-2 Servo	1	PCS	
	Servo panel	1	PCS	
	F693ZZ Bearing	1	PCS	
	M3 * 12mm countersunk screw	1	PCS	

24	M3 nut	8	PCS	
	M3*6mm round head screw	5	PCS	
	M3 self-locking nut	1	PCS	
	M3*8mm round head screw	8	PCS	
<b>Detailed steps</b>	<b>Description</b>		<b>Installation Diagram</b>	

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1. Use 4 M3 \* 8mm round head screws and 4 M3 nuts to assemble the two U-shaped brackets symmetrically.

The assembled component is named Structure C.

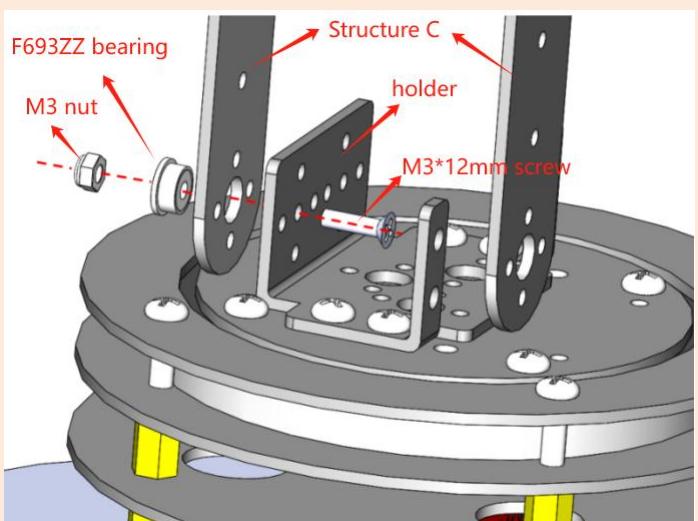
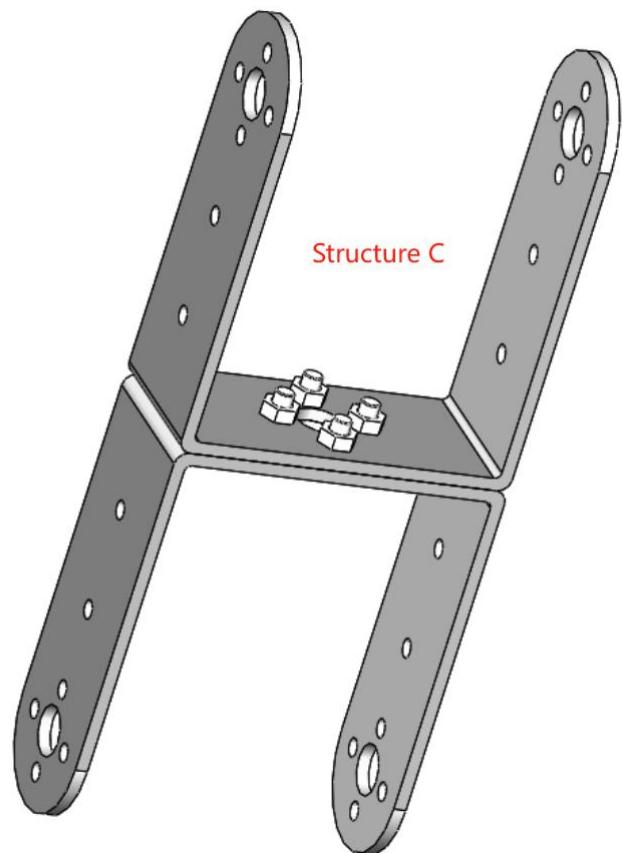


26

2. Use a M3 \* 12mm countersunk screw and a M3 self-locking nut to fix structure C together with the F693ZZ bearing and the multifunctional holder on the Step 4 structure;

Attention: Structure C consists of two symmetrical U-shaped holders, so there is no need to distinguish the direction during assembly, Both ends are the same.

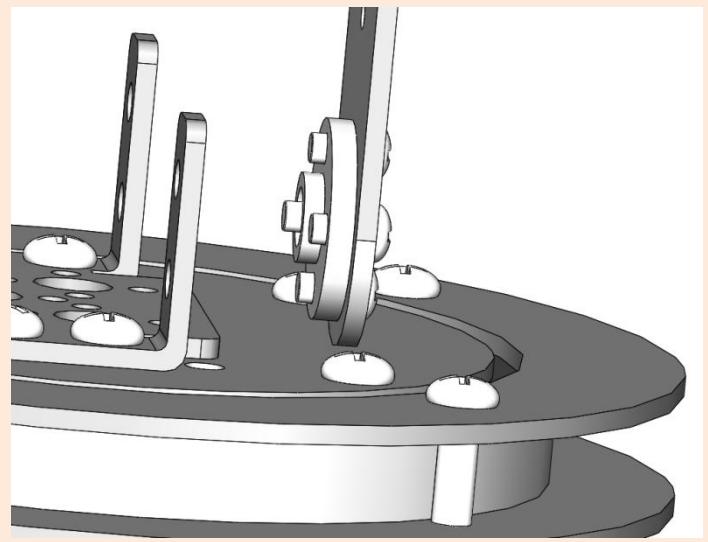
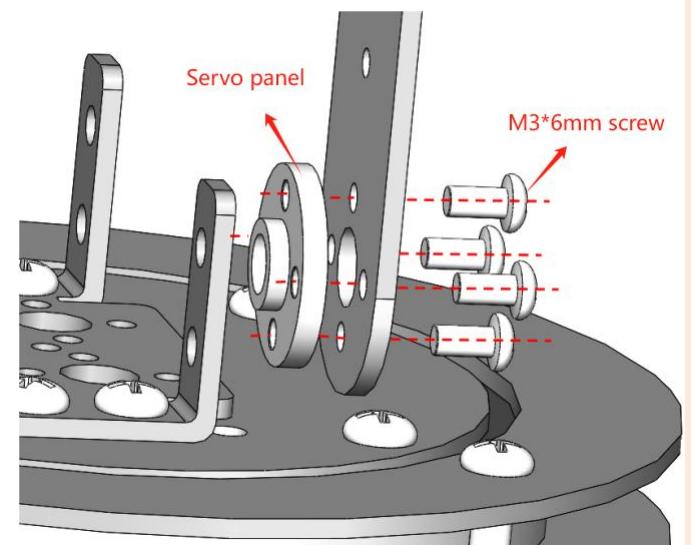
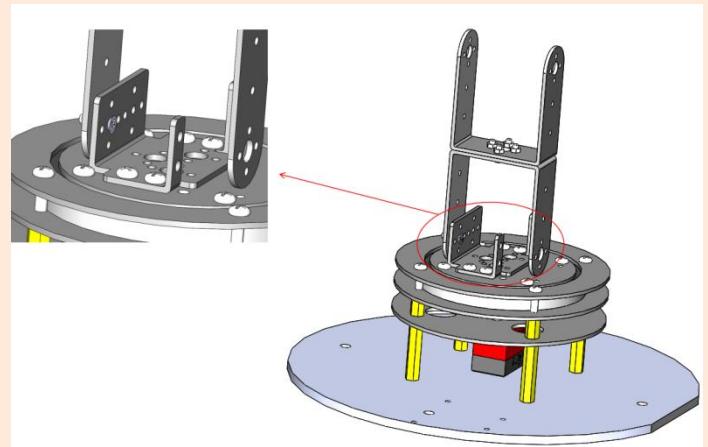
We need to pay attention to the spatial sequence between structure C, multifunctional holder, and F693ZZ bearing;



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3. Use 4 pcs M3 \* 6mm round head screws to fix the Servo panel in the corresponding position on the U-shaped holder

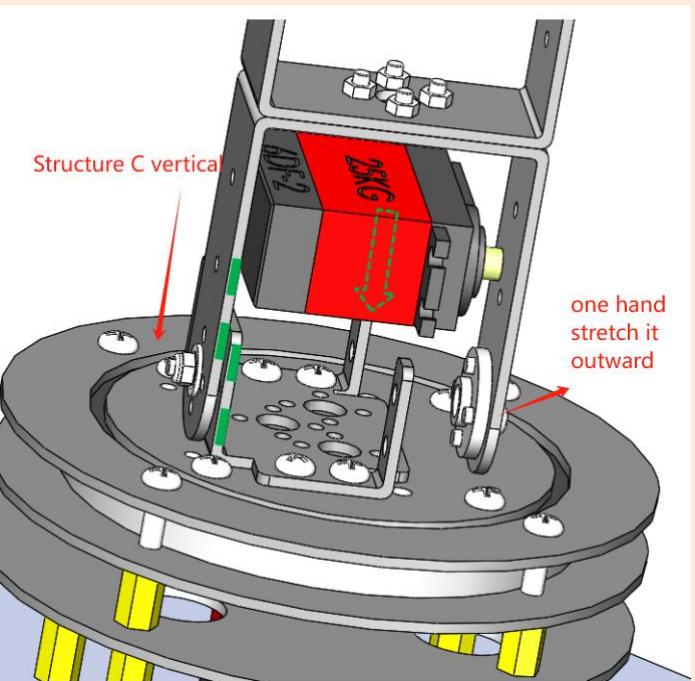
**Attention:** assembly direction of servo panel;



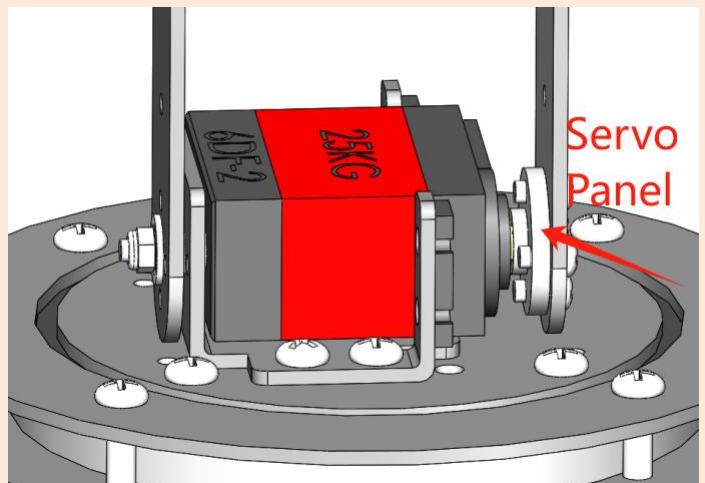
28

4. Rotate structure C to make it vertical, and prepare the 6DF-2 servo for assembly. With one hand, stretch the U-shaped holder that has been assembled with the servo panel outward, while with the other hand, place the 6DF-2 servo into the slot of the multifunctional holder.

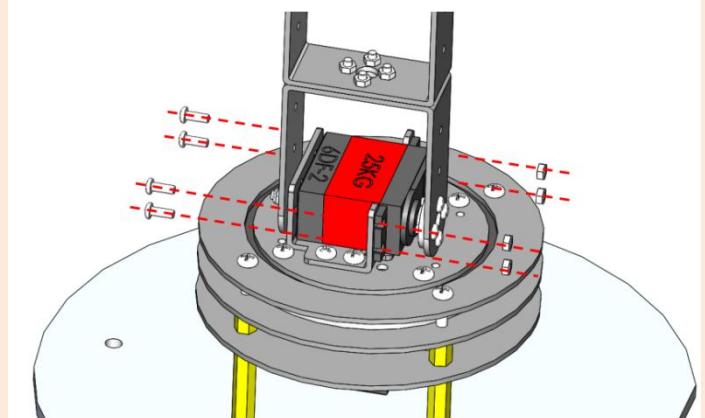
(Note that when placing the 6DF-2 servo, the side with characters should face upwards)



5. Insert the servo shaft into the servo panel on the U-shaped holder  
 (During assembly, it is necessary to hold the U-shaped bracket with your hand to maintain a vertical position);

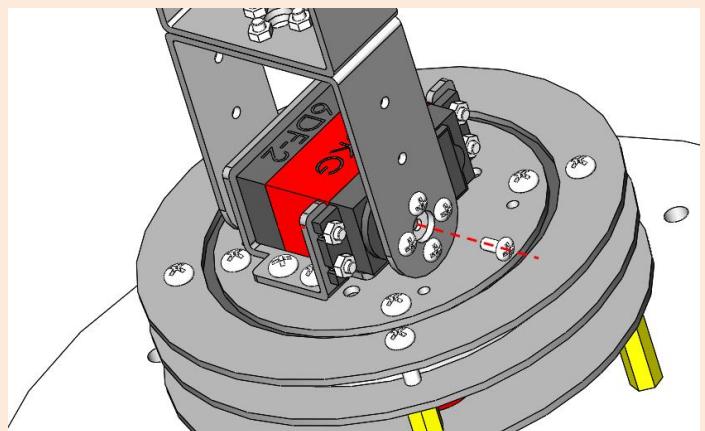
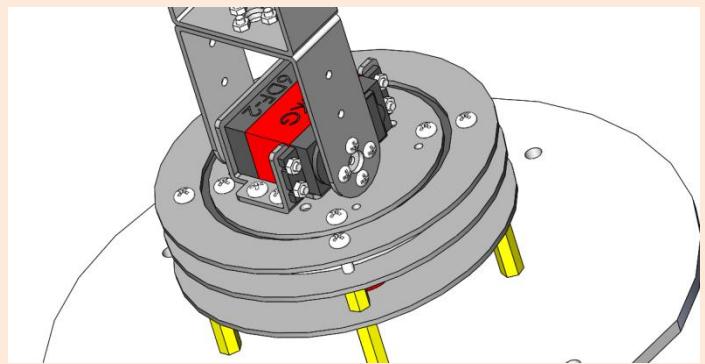


6. Use M3 \* 8mm round head screw and M3 nut to fix the 6DF-2 servo on the multifunctional bracket;



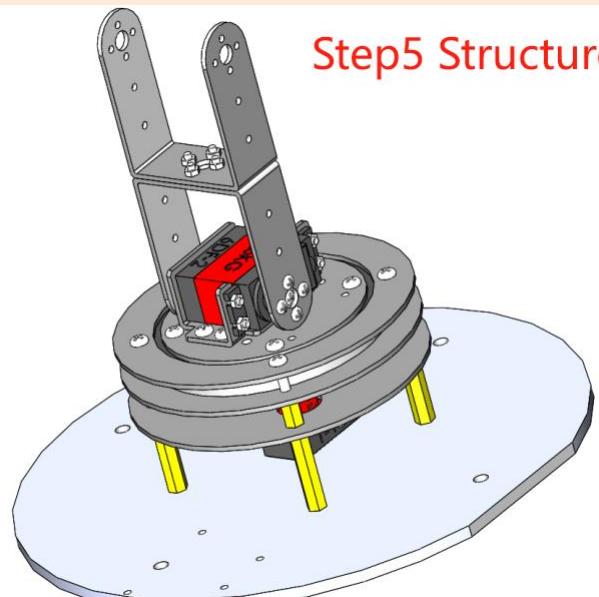
29

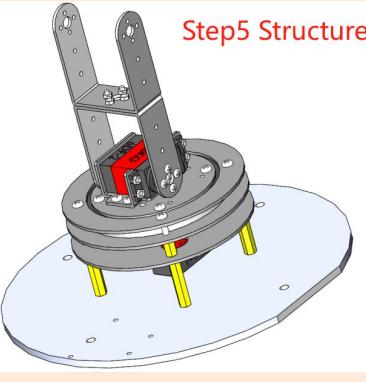
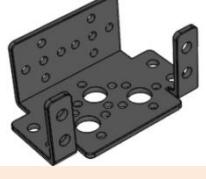
7. Use M3 \* 6mm round head screw to fix the servo panel and servo shaft;



Step 5 Structure (As shown in the figure on the right)

Step5 Structure



Parts List	Name	Quantity	Unit	Picture	
				Tool	M3 cross screwdriver 
	Step 5	1	PCS		Step5 Structure
	U-shaped holder	1	PCS		
	Multi functional holder	1	PCS		
	L-shaped holder	1	PCS		

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	Servo panel	1	PCS	
31	F693ZZ bearing	1	PCS	
	M3 * 12mm countersunk screw	1	PCS	
	M3 nut	12	PCS	
	M3 Self-locking nut	1	PCS	
	M3*8mm round head screw	12	PCS	
	M3*6mm round head screw	5	PCS	
<b>Detailed steps</b>	<b>Description</b>		<b>Installation Diagram</b>	

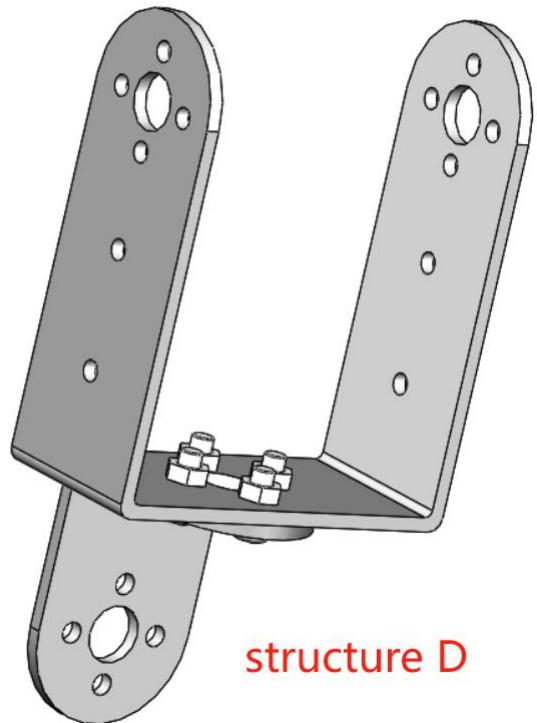
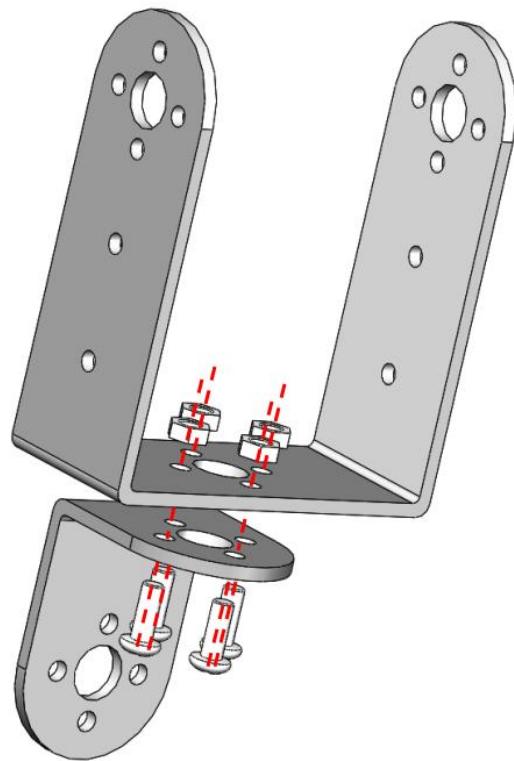
32

1. Using 4pcs M3 \* 8mm round head screws and 4 pcs M3 nuts to assemble the U-shape holder and L-shape holder together ,named it structure D.

Attention: L-shaped holder assembly direction (use the shorter side for assembly);

A

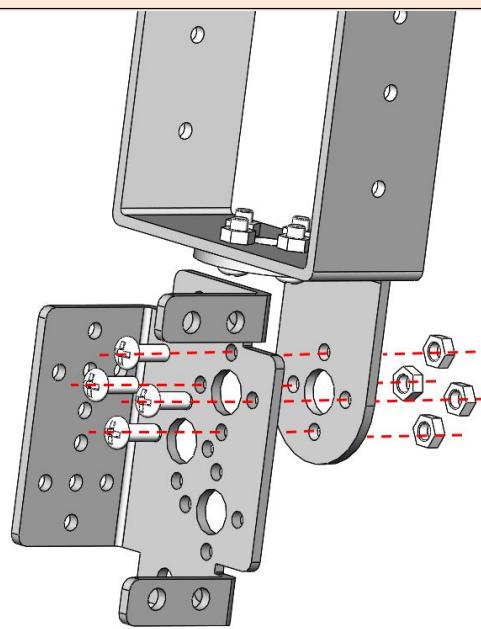
Structure D (As shown in the figure on the right)



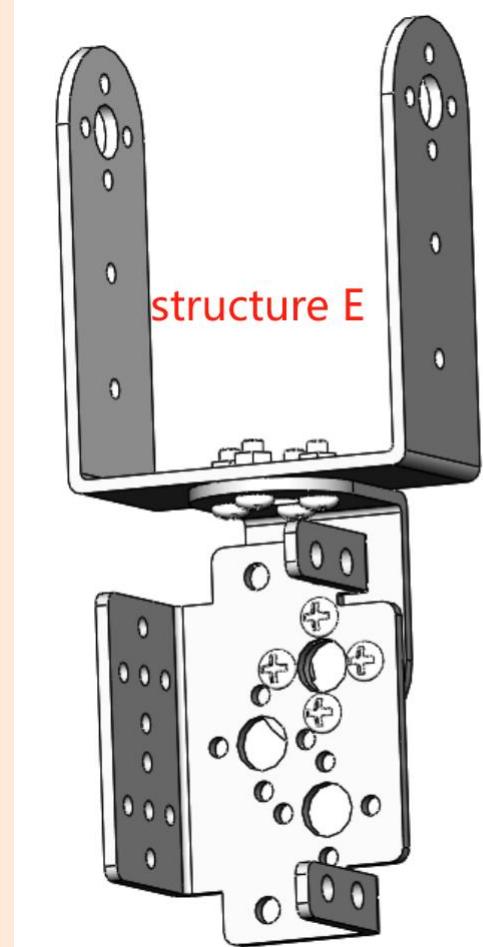
33

2. Using 4 pcs M3 \* 8mm round head screws and 4 pcs M3 nuts to assemble structure D and Multi functional holder together , and name it structure E;

**Attention:** Assembly direction of Multi functional holder;



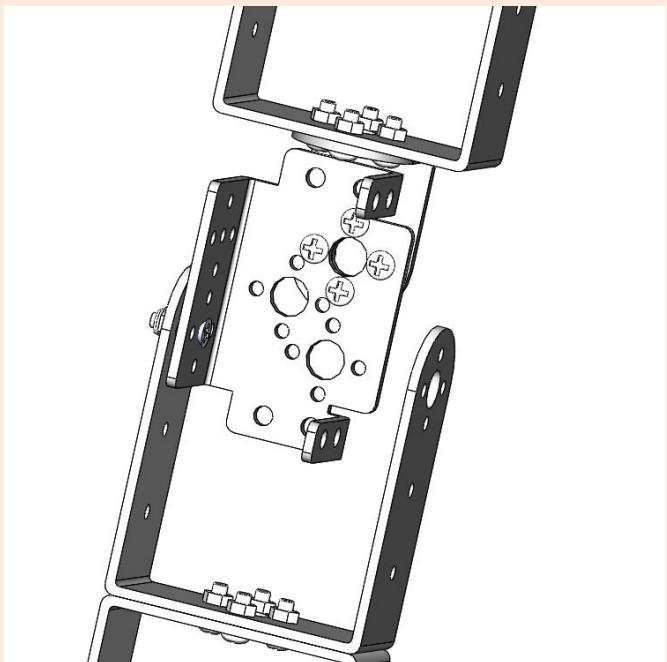
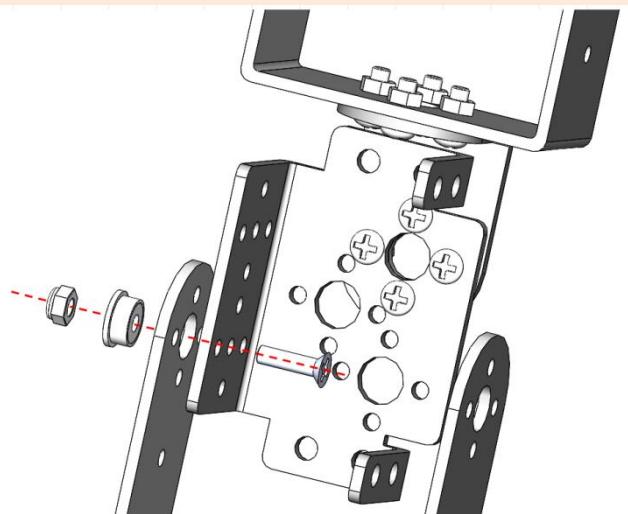
Structure E (As shown in the figure on the right)



34

3. Assemble structure E, Step 5 structure, and F693ZZ bearing together in order, and then using one M3 \* 12mm countersunk screw and one M3 self-locking nut to fix them;

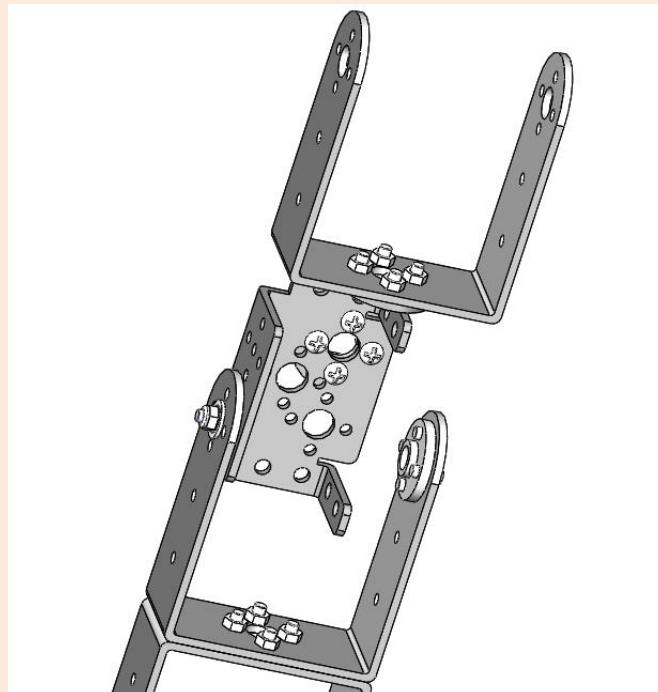
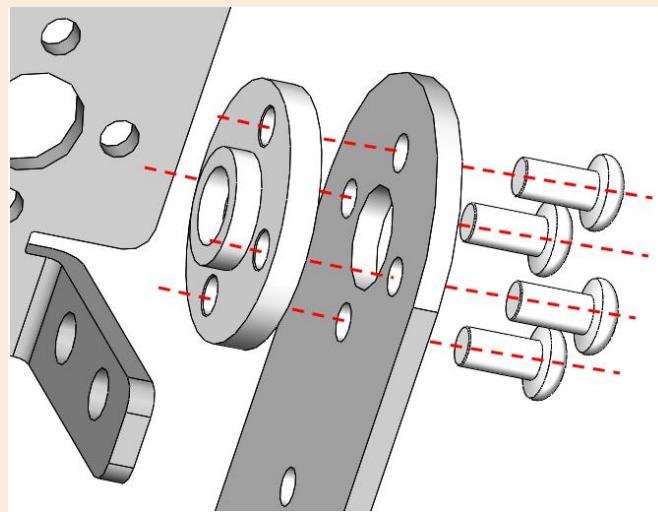
**Attention:** Assembly sequence of Multi functional holder, U-shape holder, F693ZZ bearing;



35

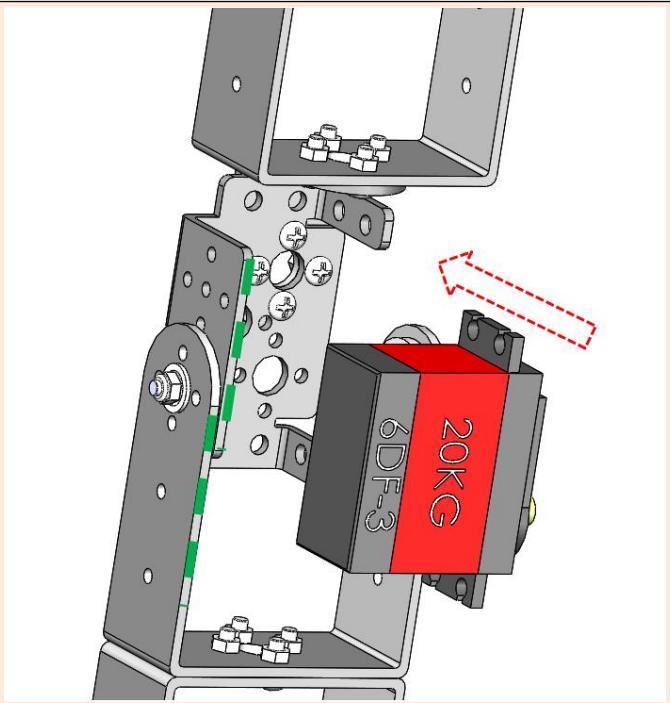
4. Use 4 pcs M3 \* 6mm round head screws to fix the Servo panel in the corresponding position on the U-shape holder;;

Attention: Assembly direction of servo panel;

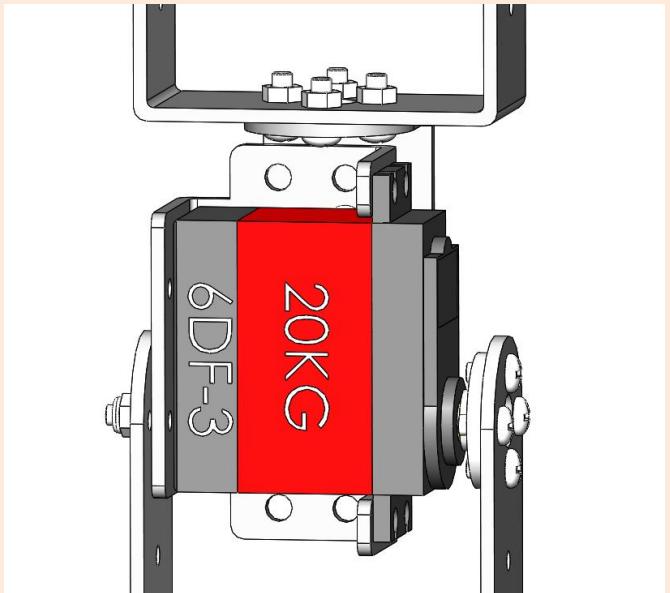


36

5. Manually rotate the Multi functional holder to be parallel to the U-shape holder (**as indicated by the green dashed line in the right figure**), Maintain this parallel state, with one hand stretch the U-shaped holder that has been assembled with the servo panel outward, while with the other hand, place the 6DF-3 servo into the slot of the multifunctional holder;

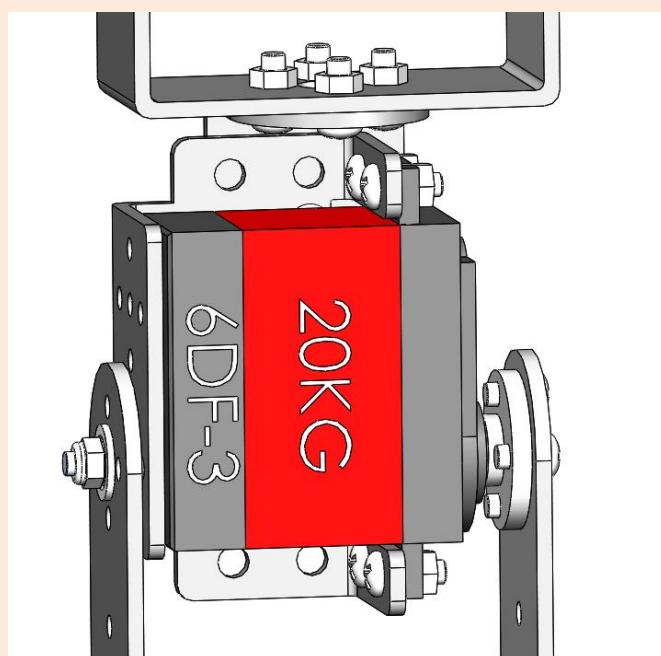
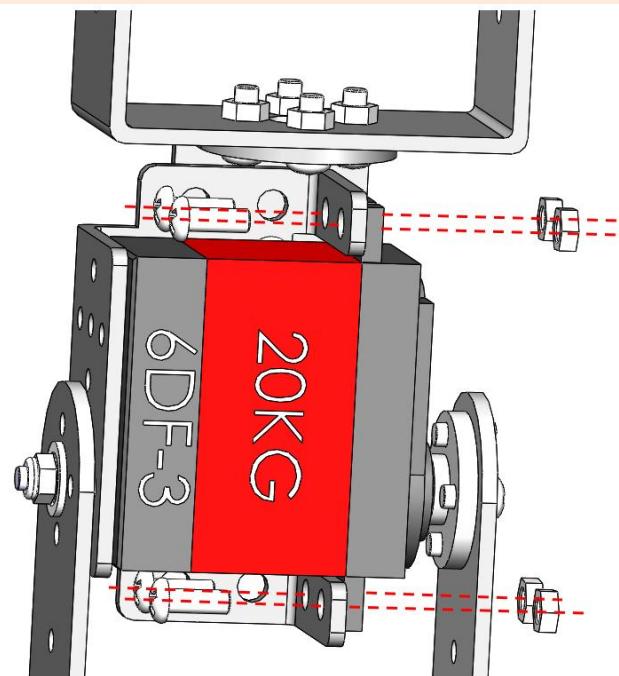


6. Insert the servo shaft into the servo panel on the U-shape holder (**assembly requires pulling the U-shape holder outward by hand**);



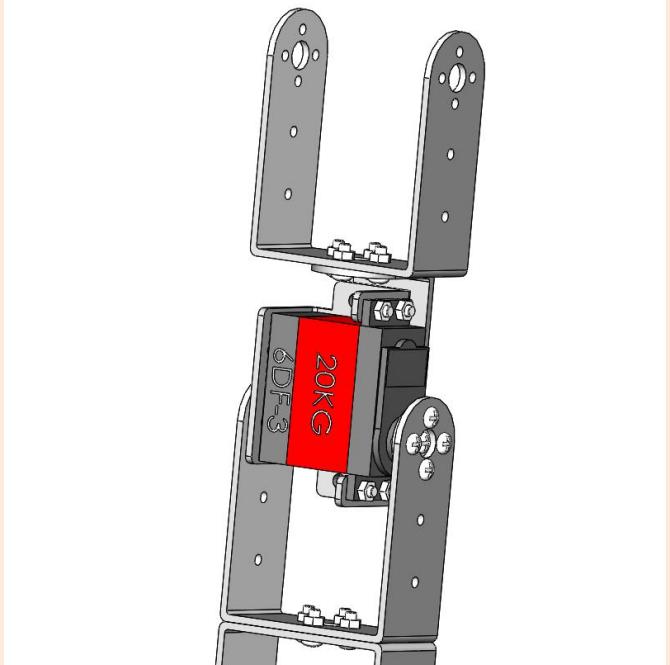
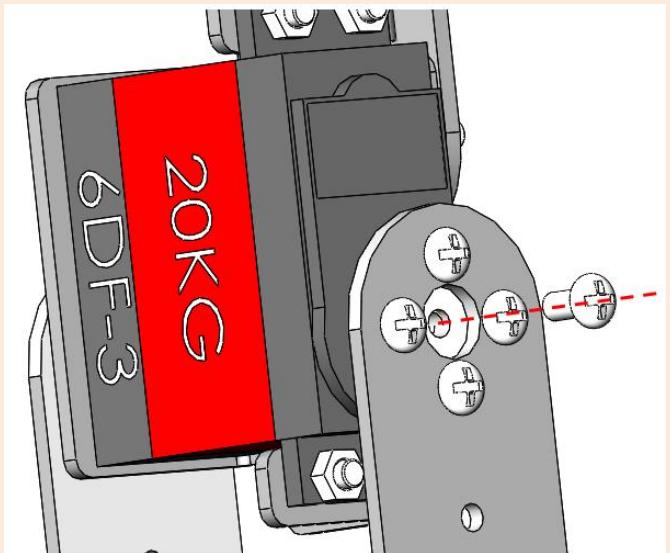
37

7.Using 4 M3 \* 8mm round head screws and 4 M3 nuts to fix the servo on the Multi functional holder(For the convenience of assembling screws and nuts, the Multi functional holder can be rotated here. When it is perpendicular to the U-shape holder, there will be no interference during the assembly of screws and nuts. After completion, rotate the Multi functional holder to restore its parallelism with the U-shape holder);



38

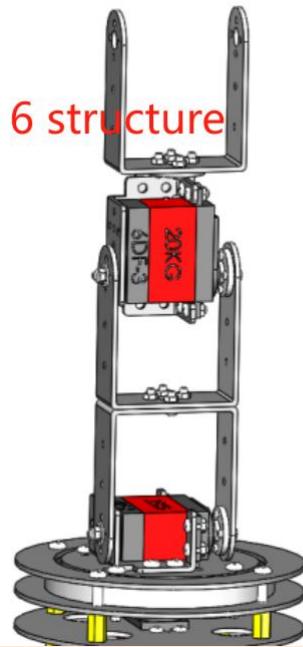
8. Use one M3 \* 6mm round head screw to fix the servo panel and servo shaft;



39

Step 6 Structure (As shown in the figure on the right)

Step 6 structure



### Step 7

Assemble 6DF-4  
and 6DF-5 servos

Tool

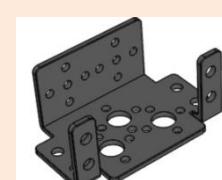
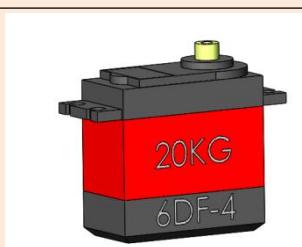
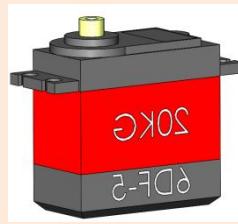
M3 Phillips screwdriver



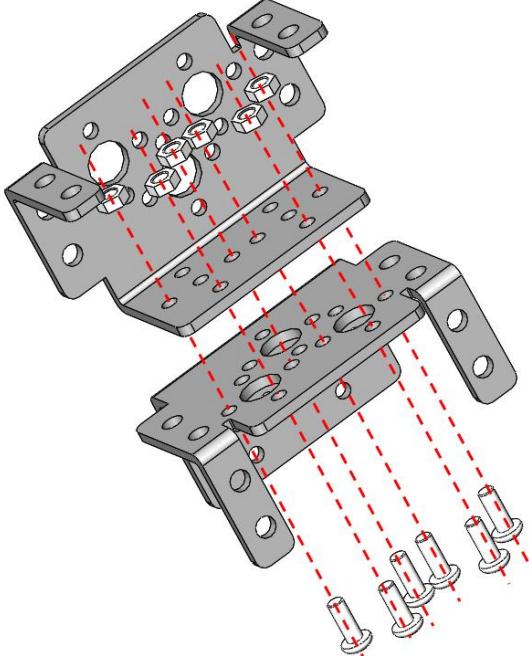
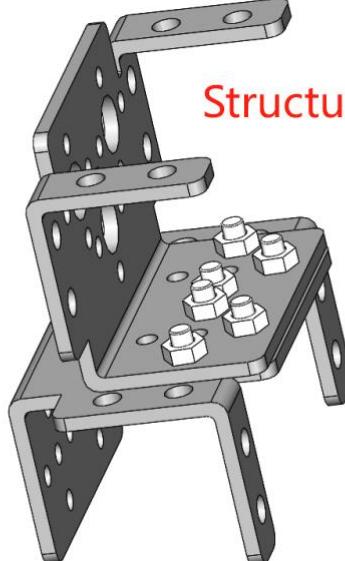
simple wrench



Part list	Name	Quantity	Unit	Picture
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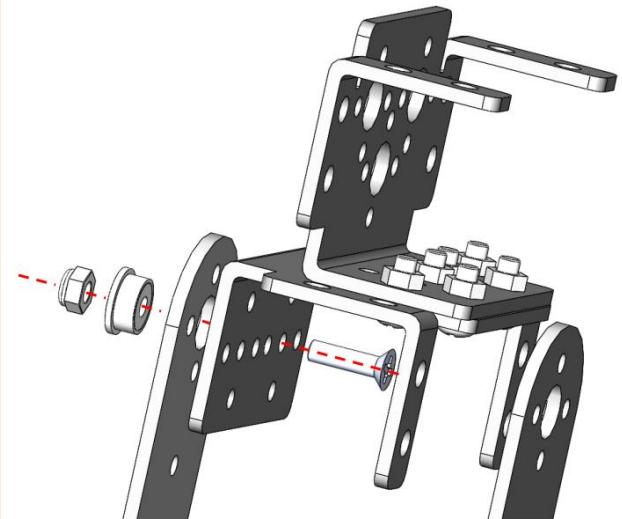
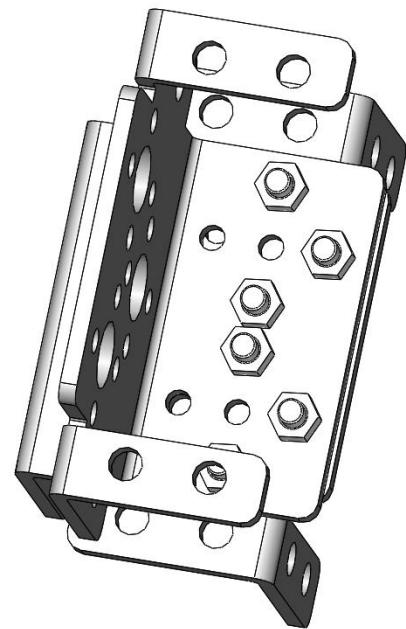
40	step 6 structure	1	PCS	 <b>Step 6 structure</b>
	Multi functional holder	2	PCS	
	6DF-4 servo	1	PCS	 20KG 6DF-4
	6DF-5 servo	1	PCS	 20KG 6DF-5

41	Servo panel	1	PCS	
F693ZZ bearing	1	PCS		
M3 Self-locking nut	1	PCS		
M3 nut	14	PCS		
M3*6mm round head screw	11	PCS		
M3*8mm round head screw	8	PCS		
M3*12mm countersunk screw	1	PCS		
Detailed	Description		Installation Diagram	

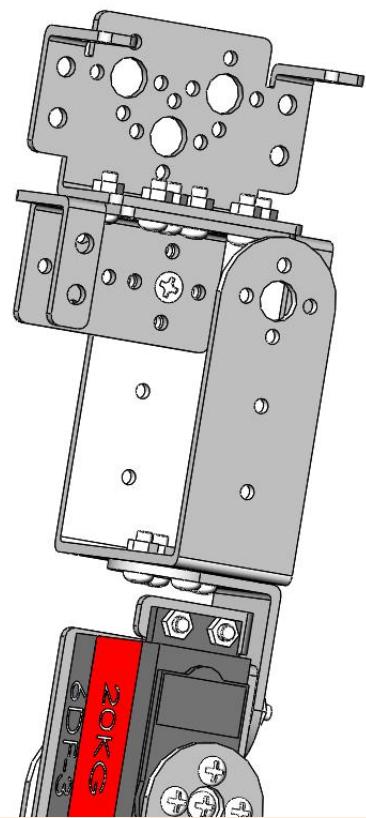
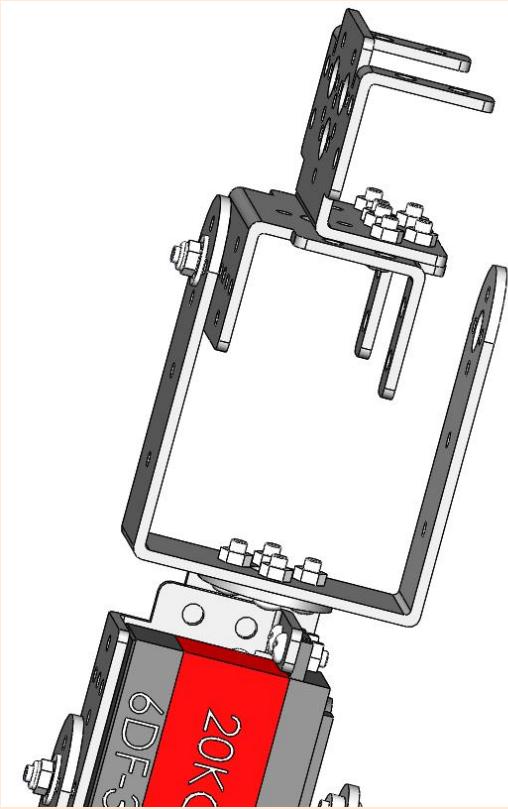
steps	
42	<p>1. Assemble two Multi functional holders together using 6 pcs M3 * 6mm round head screws and 6 pcs M3 nuts, and name it Structure F;</p> <p>Attention: Assembly direction of Multi functional holder;</p> <p>Structure F(As shown in the figure on the right)</p>  

43

2. Assemble the Multi functional holder of structure F, the U-shaped holder of structure 6, and the F693ZZ bearing together in order, and then fix them by using an M3 \* 12mm counter screw and an M3 Self locking nut.



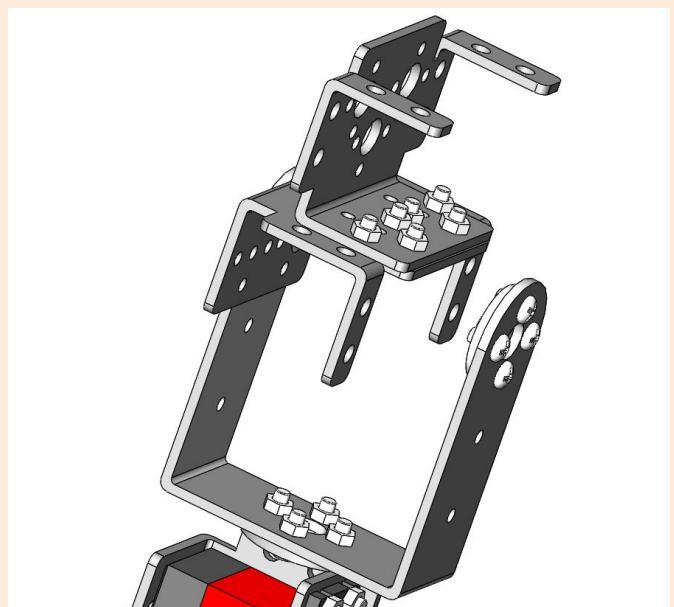
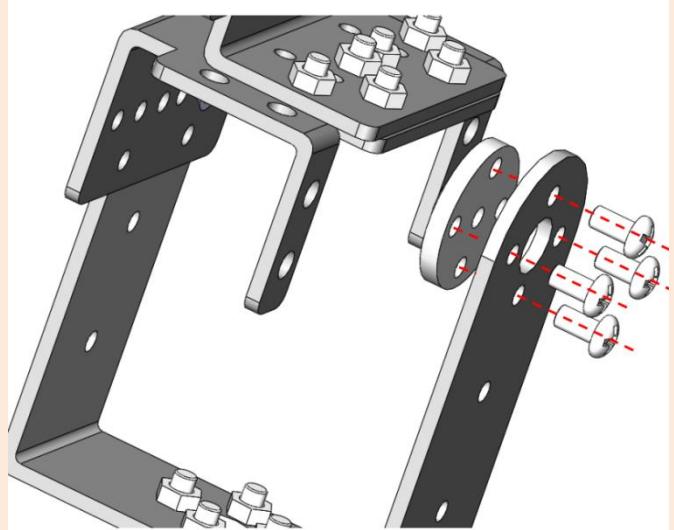
44



45

3. Use 4 pcs M3 \* 6mm round head screws to fix the Servo panel in the corresponding position on the U-shape holder;

Attention: servo panel assembly direction;

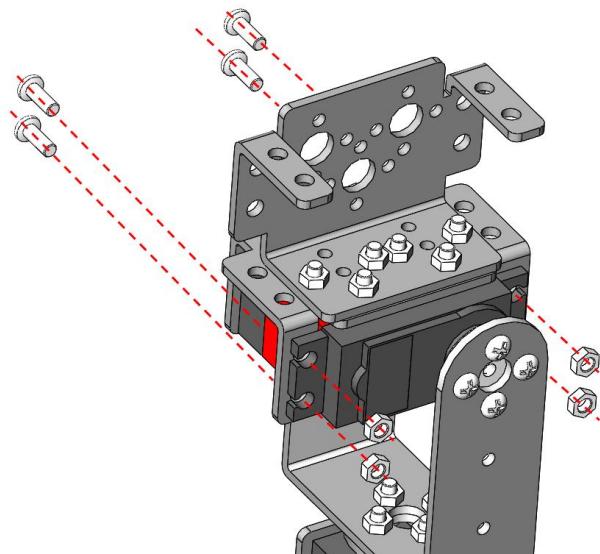
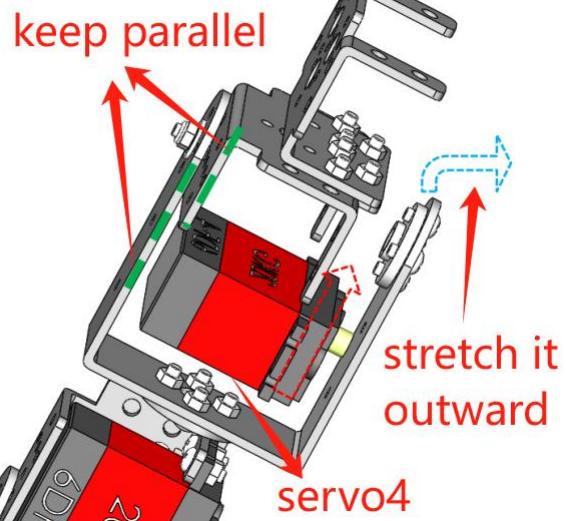


46

4. Manually rotate the Multi functional holder to keep it parallel to the U-shape holder (**refer to the green dashed line in the right figure for the parallel state**); with one hand stretch the U-shaped holder that has been assembled with the servo panel outward, while with the other hand, place the 6DF-4 servo into the slot of the multifunctional holder;

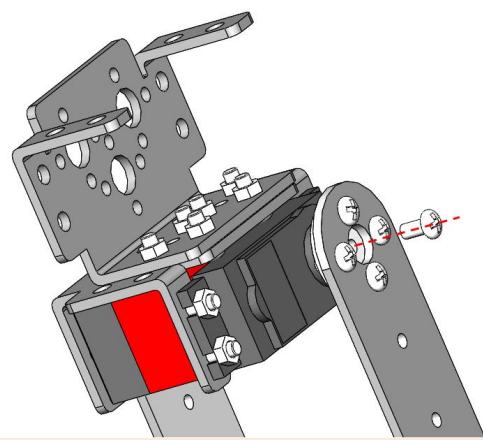
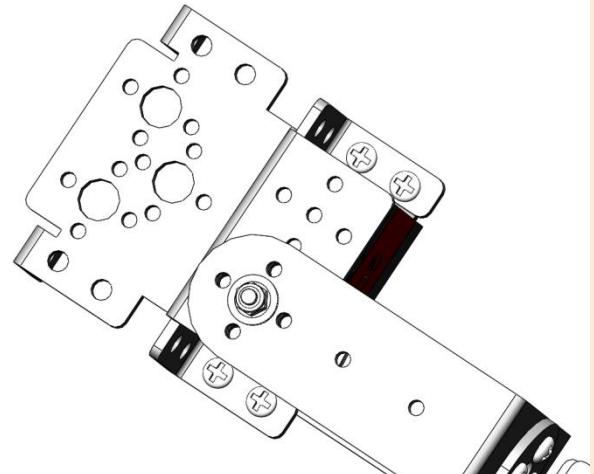
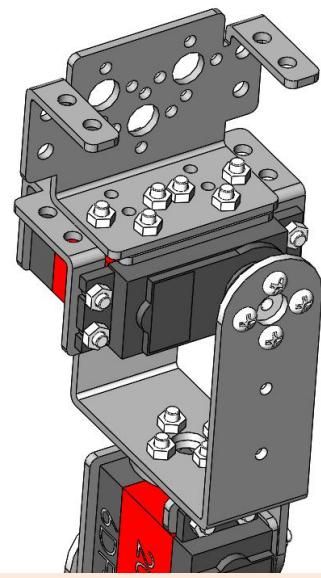
Use one hand to stretch the side of the U-shape holder with the servo panel installed on it outward, and hold the 6DF-4 servo with the other hand. Insert the servo shaft into the servo panel (**note that this step requires keeping the U-shape holder and Multi functional holder parallel at all times**);

5.Fix the 6DF-4 servo onto the Multi functional holder by using 4 pcs M3 \* 8mm round head screws and 4 pcs M3 nuts;



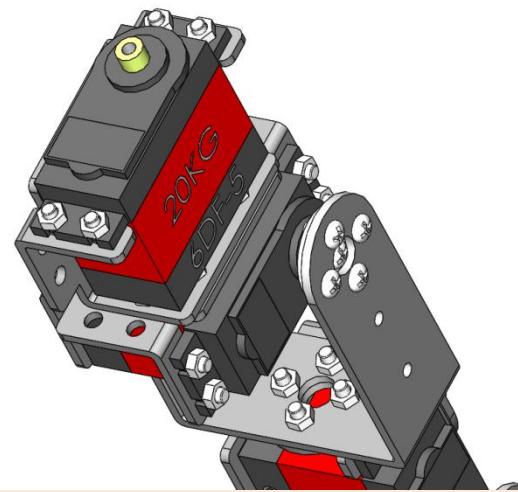
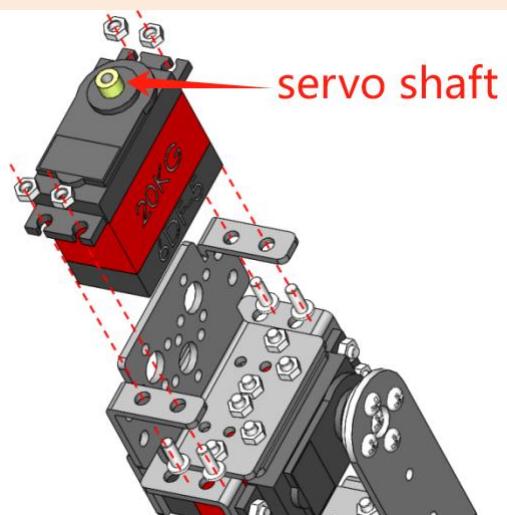
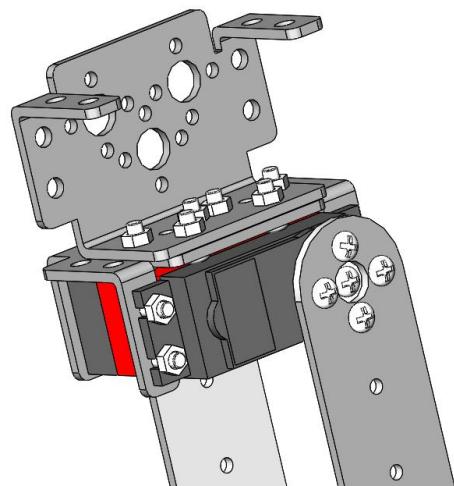
47

6. Use an M3 \* 6mm round head screw to fix the panel and shaft of the 6DF-4 Servo;

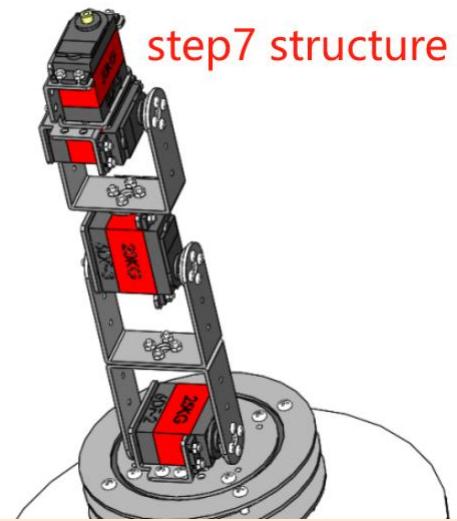


48

9. Place the 6DF-5 servo into the slot of the Multi functional holder, and use 4 pcs M3 \* 8mm round head screws and 4 pcs M3 nuts to secure the servo 6DF-5 to the Multi functional holder; (Note: Use the servo shaft as a reference for the assembly direction of the servo);



49



### Step 8

Assemble 6DF-6  
servo

Tool

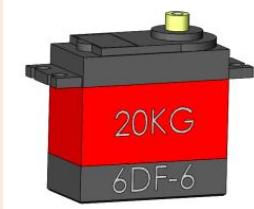
M3 Phillips screwdriver



simple wrench



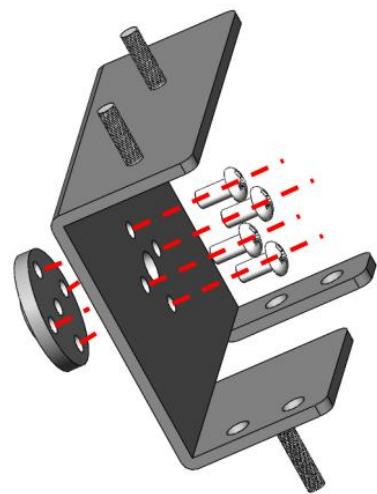
Part list	Name	Quantity	Unit	Picture	
	step 7 structure	1	PCS	 A 3D CAD rendering of the Step 7 robot's mechanical frame, identical to the one shown in the previous image. The text "step7 structure" is written in red in the upper right corner of the image.	

50	U-shaped holder for claw	1	PCS	
	6DF-6 servo	1	PCS	
	servo panel	1	PCS	
	M3*11mm + 6 mm copper column	4	PCS	
	M3 nut	4	PCS	
	M3*8mm round head screw	4	PCS	
	M3*6mm round head screw	5	PCS	
Detailed steps	Description		Installation Diagram	

51

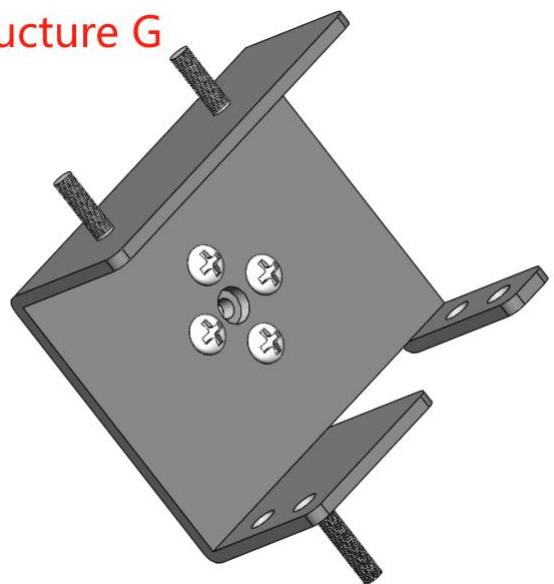
1. Assemble the Servo panel onto the U-shaped metal bracket by using 4 pcs M3 \* 6mm round head screws; And named it Structure G.

Attention: 1. The assembly direction of the Servo panel; 2. First assemble two screws diagonally, then assemble the other two diagonally and tighten them with a screwdriver;



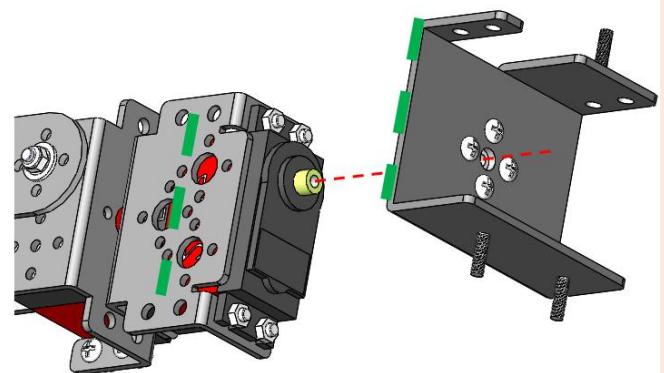
Structure G(As shown in the figure on the right)

structure G

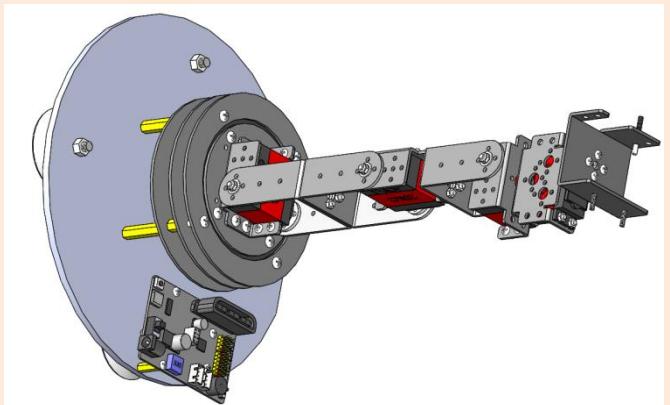
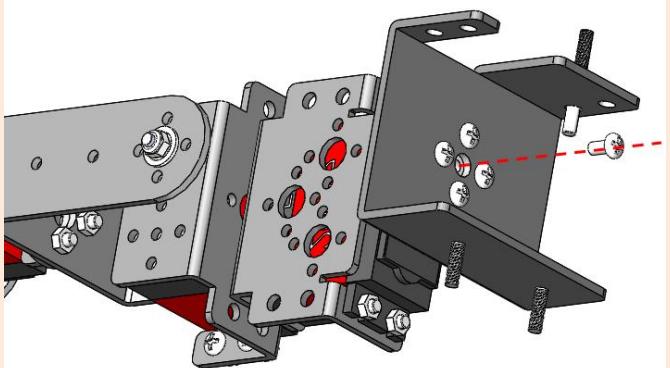


52

2. Assemble structure G onto the 6DF-5 servo shaft of Step 7 structure (keep the U-shape holder parallel to the Multi functional holder during assembly, please refer to the green dashed line in the right figure for the parallel state);



3. Use an M3 \* 6mm round head screw to secure the U-shaped holder onto the 6DF-5 servo shaft;

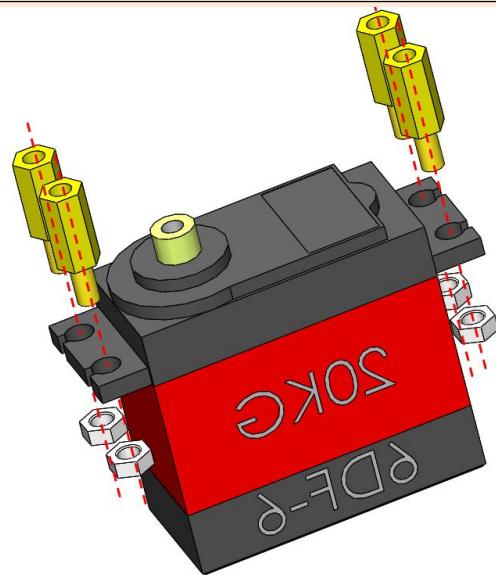


53

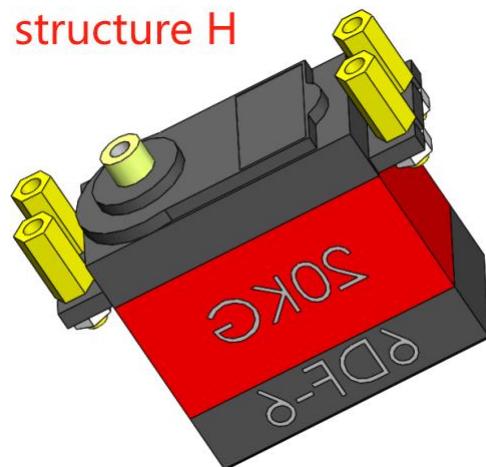
4. Use 4 pcs M3 nut to assemble 4 pcs M3 \* 11mm+6mm copper column onto 6DF-6 servo; and named it structure H;

Note that M3 nut cannot be tightened yet;

Structure H(As shown in the figure on the right)

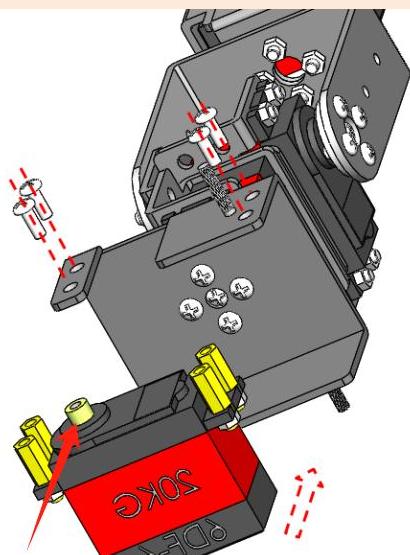


structure H



5. Use 4 pcs M3 \* 8mm round head screws to secure the structure H to the claw U-shape holder and tighten the M3 nuts; Finally obtaining the structure of Step 8.

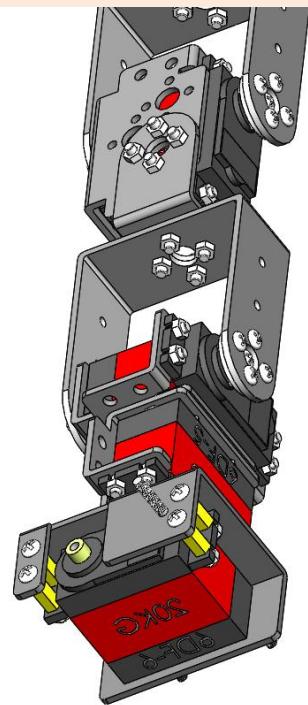
Attention: servo assembly direction, servo shaft as reference;



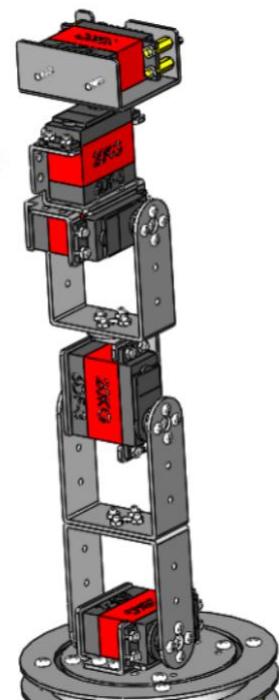
servo shaft

54

Step 8 structure (As shown in the figure on the right)



Step 8  
structure



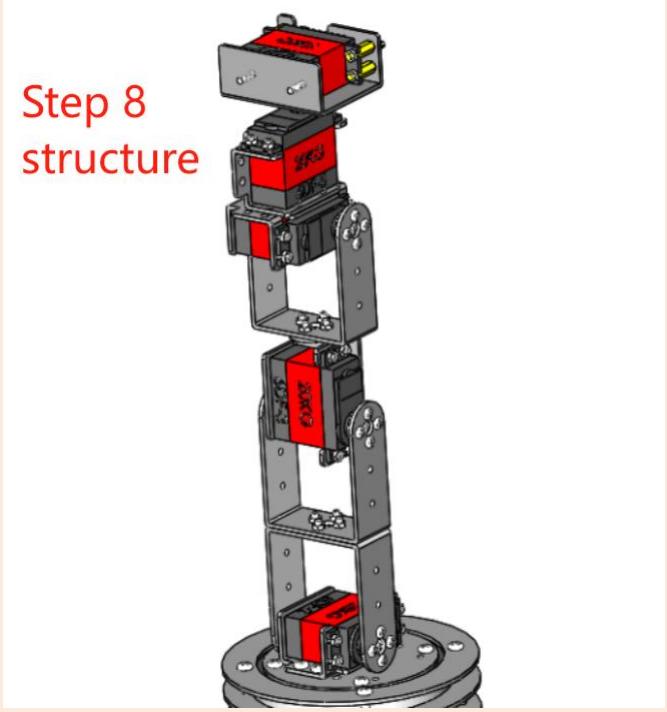
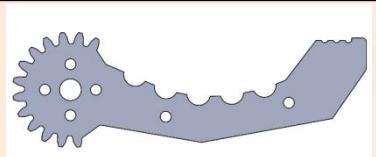
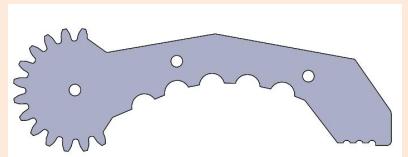
**Step 9**

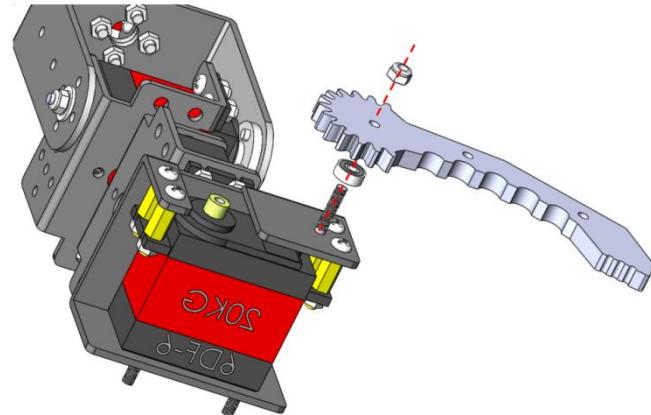
Assemble acrylic  
structural  
component 1 and 2

**Tool**

M3 Phillips screwdriver



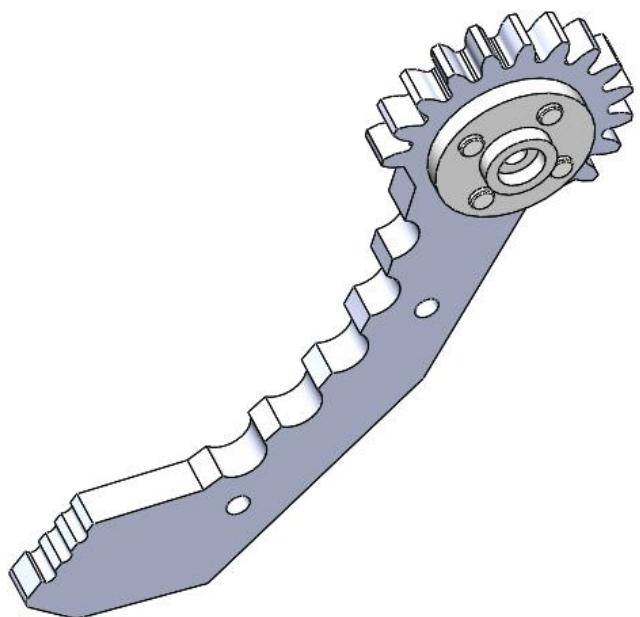
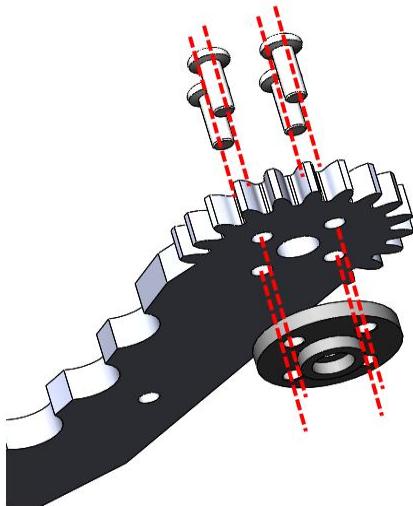
				simple wrench
				
Part list  55	Name	Quantity	Unit	Picture
	step 8 structure	1	PCS	 Step 8 structure
	F619/3Z bearing	1	PCS	
	Acrylic structural component 1	1	PCS	
	Acrylic structural component 2	1	PCS	

56	Servo panel	1	PCS	
	M3 Self-locking nut	1	PCS	
	M3*8mm round head screw	4	PCS	
	M3*6mm round head screw	1	PCS	
Detailed steps	Description		Installation Diagram	
	<p>1. Assemble the bearing and acrylic structural component 2 onto the screw of the U-shaped metal holder of the claw in sequence, and then fix it with M3 Self locking nut;</p> <p><b>Attention:</b> The self-locking screw should not be fixed too tightly, as locking it too tightly will prevent the acrylic structural component 2 from rotating smoothly;</p>			

57

2. Assemble the Servo panel onto acrylic structural component 1 by using 4 pcs M3 \* 8mm round head screws;

**Attention:** The assembly direction of the Servo panel;



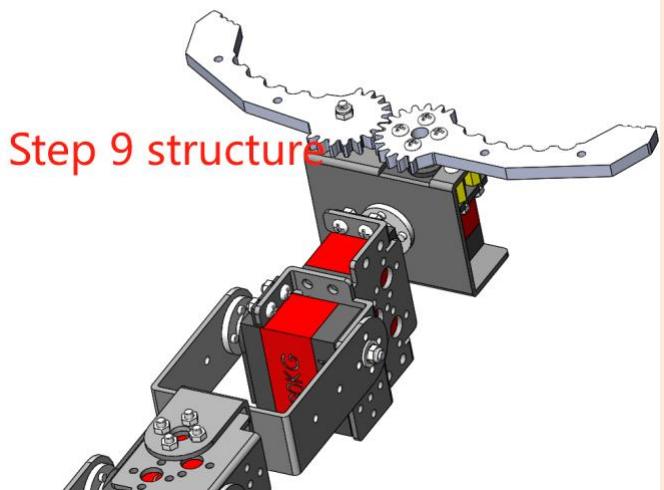
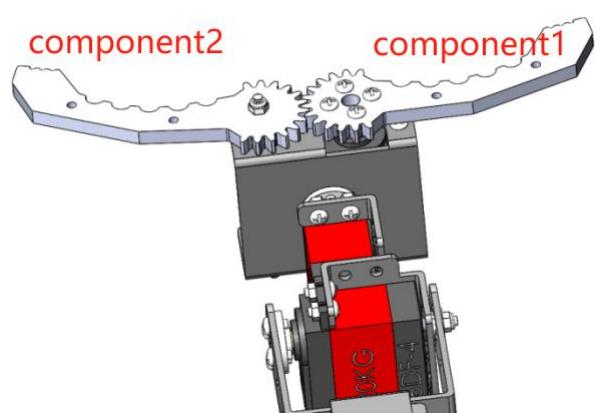
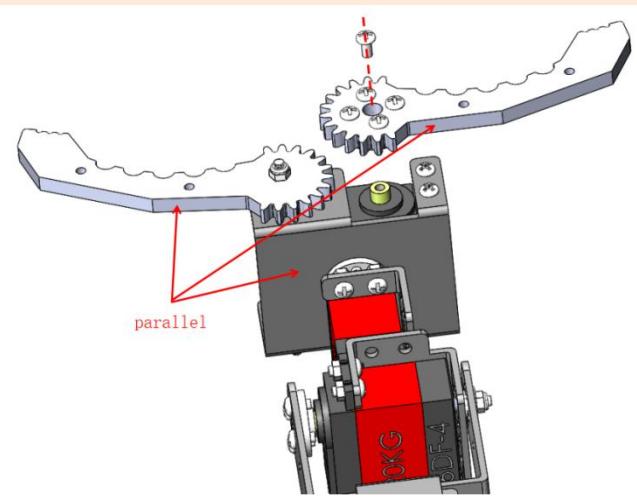
58

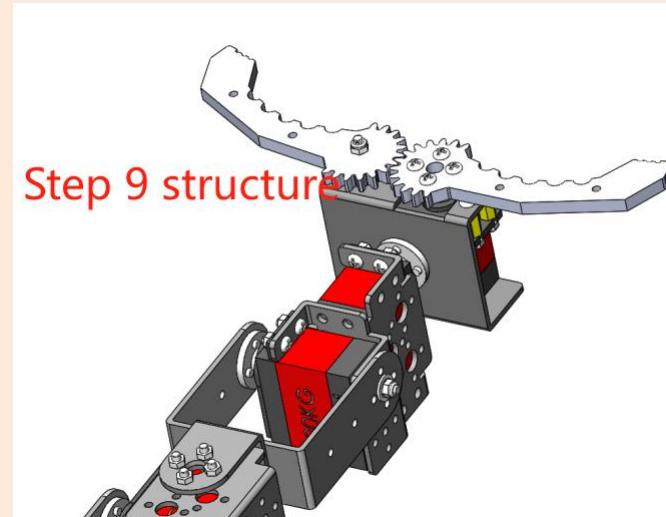
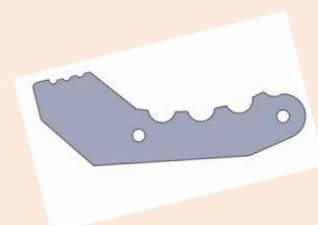
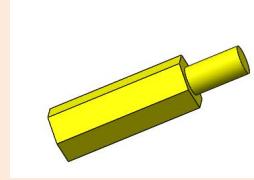
3. Rotate acrylic structural component 2 so that its side is parallel to the back of the U-shaped bracket; Take a piece of acrylic structural component 1, make its side parallel to the back of the U-shaped bracket, maintain the parallel state, and assemble the acrylic structural component 1 onto the 6DF-6 servo shaft; (Due to gear clearance, there may be degree deviation in practice, and the three surfaces will not be completely parallel.)

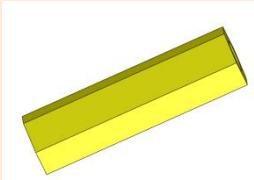
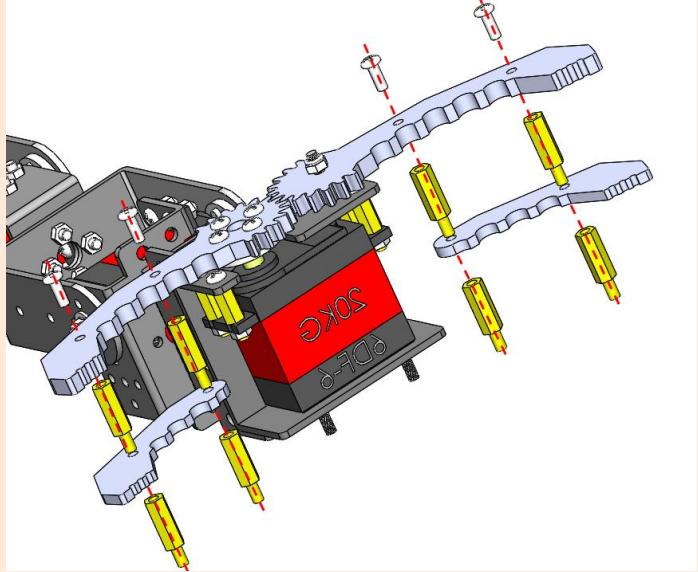
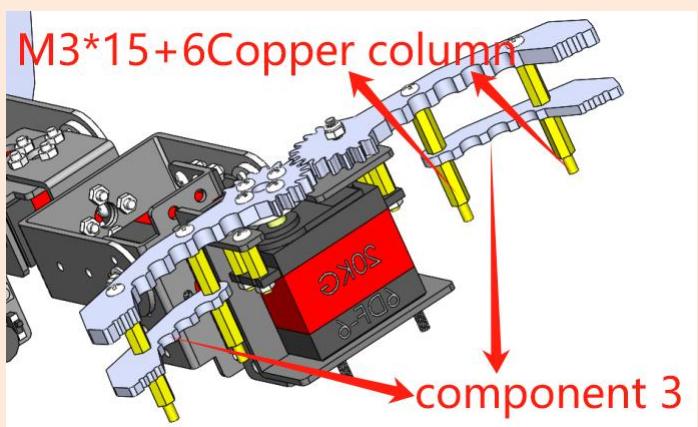
4. Use one M3 \* 6mm round head screw to fix acrylic structural component 1 onto the 6DF-6 servo shaft;

Attention: Manually rotate acrylic structural component 1, and the gears of acrylic structural component 1 and acrylic structural component 2 will mesh smoothly. If they are not smooth, these two acrylic components need to be readjusted.

Step 9 structure (As shown in the figure on the right)



Step 10		Assemble acrylic structural component 3		Tool	M3 Phillips screwdriver
Part list	Name	Quantity	Unit	Picture	
	Step 9 structure	1	PCS	 Step 9 structure	
	Acrylic structural component 3	4	PCS		
	M3*15mm+6mm copper column	8	PCS		
	M3*8mm round head screw	4	PCS		

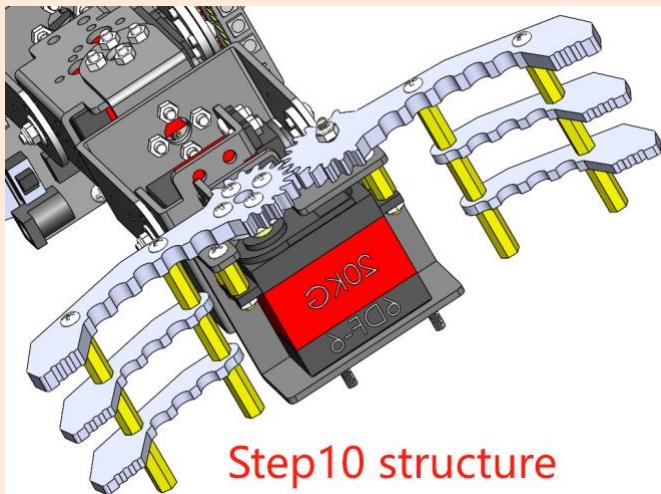
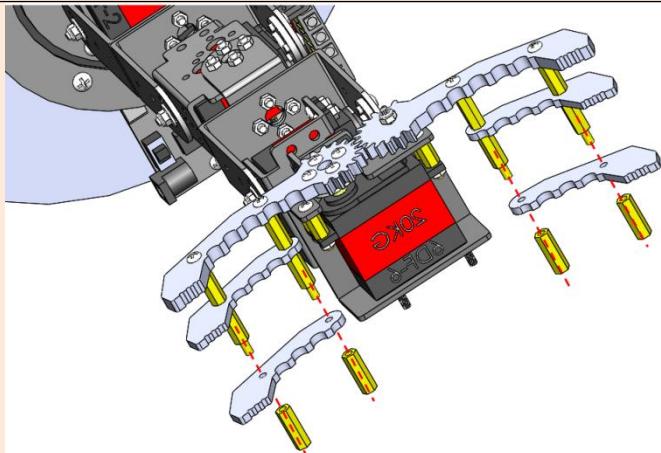
	M3*17mm double passed copper column	4	PCS	
<b>Detailed 60 steps</b>	<b>Description</b>		<b>Installation Diagram</b>	
A	<p>1. Use M3 * 8mm round head screws to sequentially fix the M3 * 15mm+6 mm copper columns in the assembly holes of acrylic structural component 1 and acrylic structural component 2;</p> <p>2. Install two acrylic structural components 3 onto the copper pillar, and fix them with M3 * 15mm+6mm copper columns</p>		 	

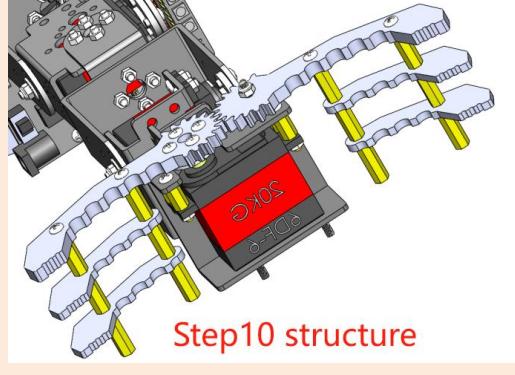
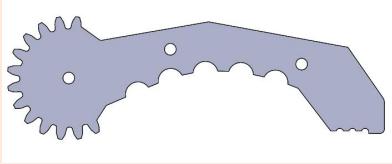
61

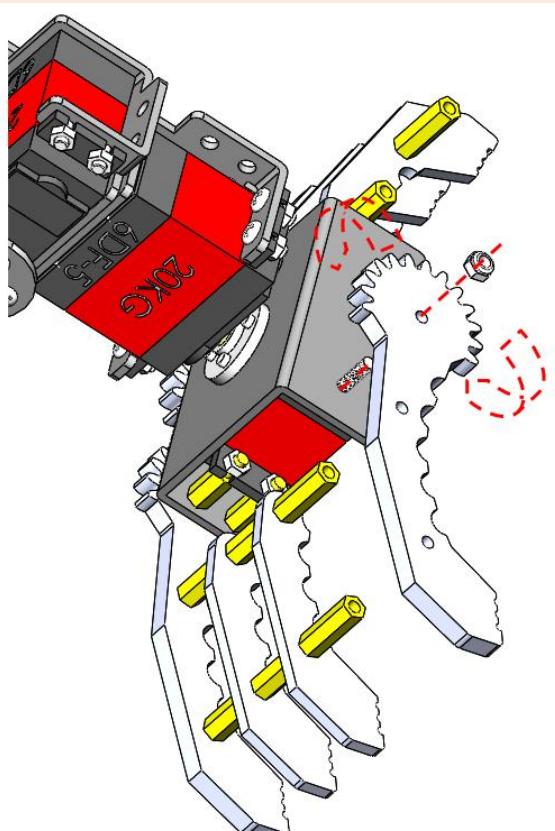
3.Using the M3 \* 17mm double passed copper columns to fix the two acrylic structural components 3 ;

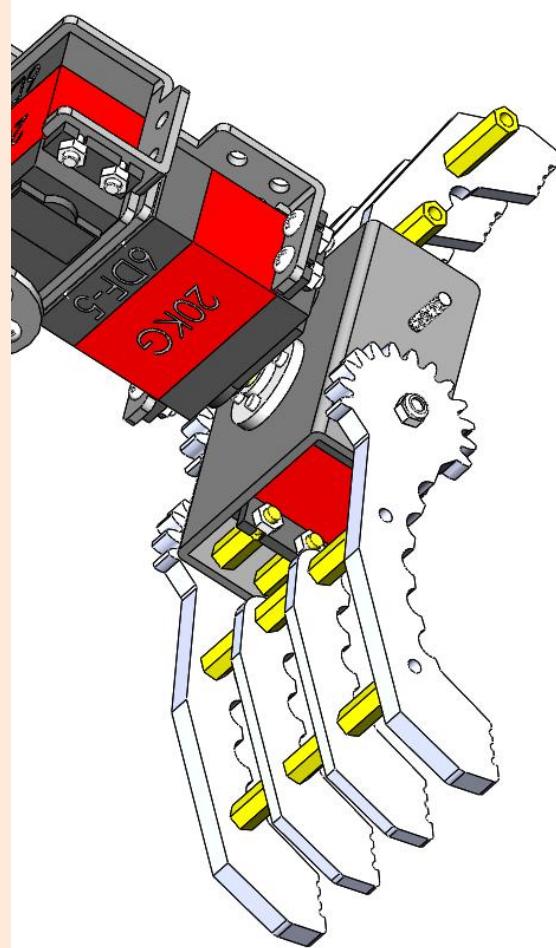
Attention: The assembly direction of Acrylic structural component 3;

Step 10 structure (As shown in the figure on the right)



62	<b>Step 11</b>	Assemble acrylic structural component 2 and acrylic structural component 4	<b>Tool</b>	M3 Phillips screwdriver
				
				simple wrench
				/
Part list	Name	Quantity	Unit	Picture
	step 10 structure	1	PCS	 Step10 structure
	Acrylic structural component 2	1	PCS	
	Acrylic structural component 4	1	PCS	

<b>63</b>	M3 Self-locking nut	2		
	M3*8 mm round head screw	4	PCS	
Detailed steps	Description		Installation Diagram	
	<p>1. Use M3 Self locking nut to fix acrylic structural component 2 onto the screw of the U-shaped metal holder;</p> <p><b>Attention:</b> The self-locking screw cannot be fixed firmly, and the acrylic structural component 2 can be manually rotated smoothly;</p>			

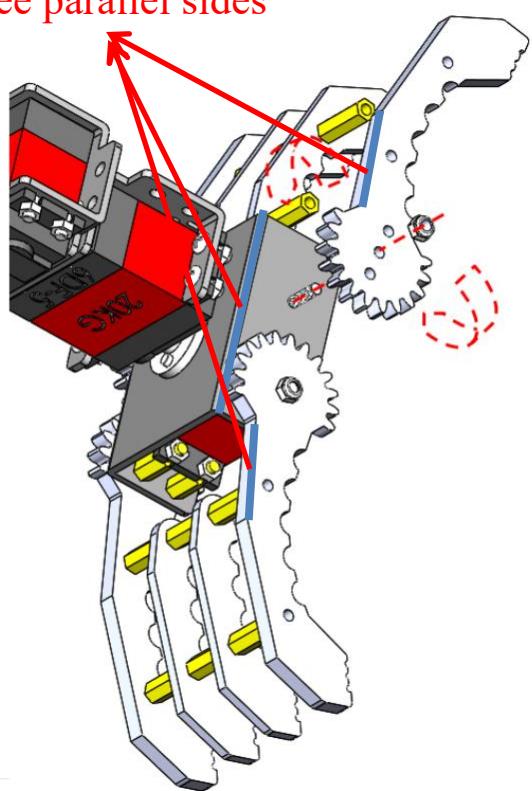


2. Rotate acrylic structural component 2 so that its side is parallel to the side of the U-shaped metal holder; Simultaneously, align the acrylic structural component 4 parallel to the side of the U-shaped metal holder and assemble it onto the screw of the U-shaped metal holder; (Please refer to the blue line marked in the right figure for the parallel state of the three sides, due to gear clearance, actual assembly may cause the side of structural component 4 to not be completely parallel to the other two sides, resulting in some degree deviation)

3. Use M3 Self locking nut to fix Acrylic structural component 4 onto the screw of the U-shaped metal holder;

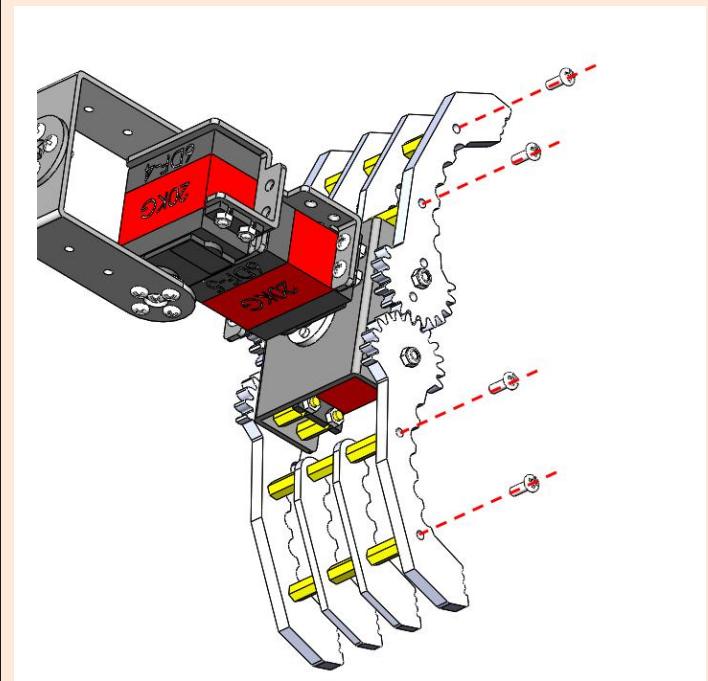
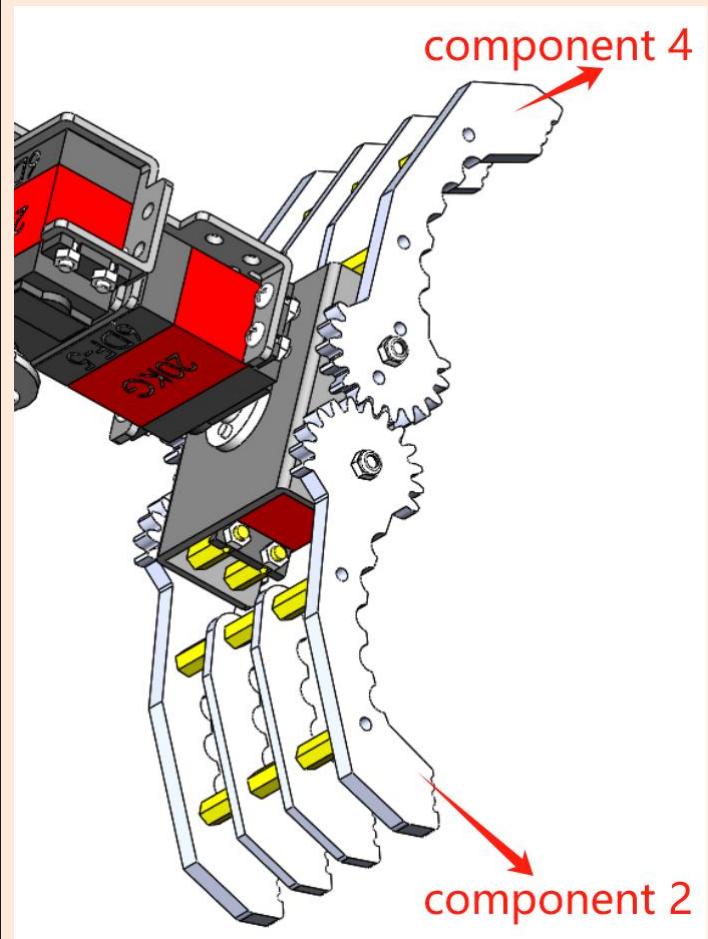
**After assembly, the desired effect is to manually rotate Acrylic Structural Component 4, ensuring smooth meshing between the gears of Acrylic Structural Component 4 and Acrylic Structural Component 2;**

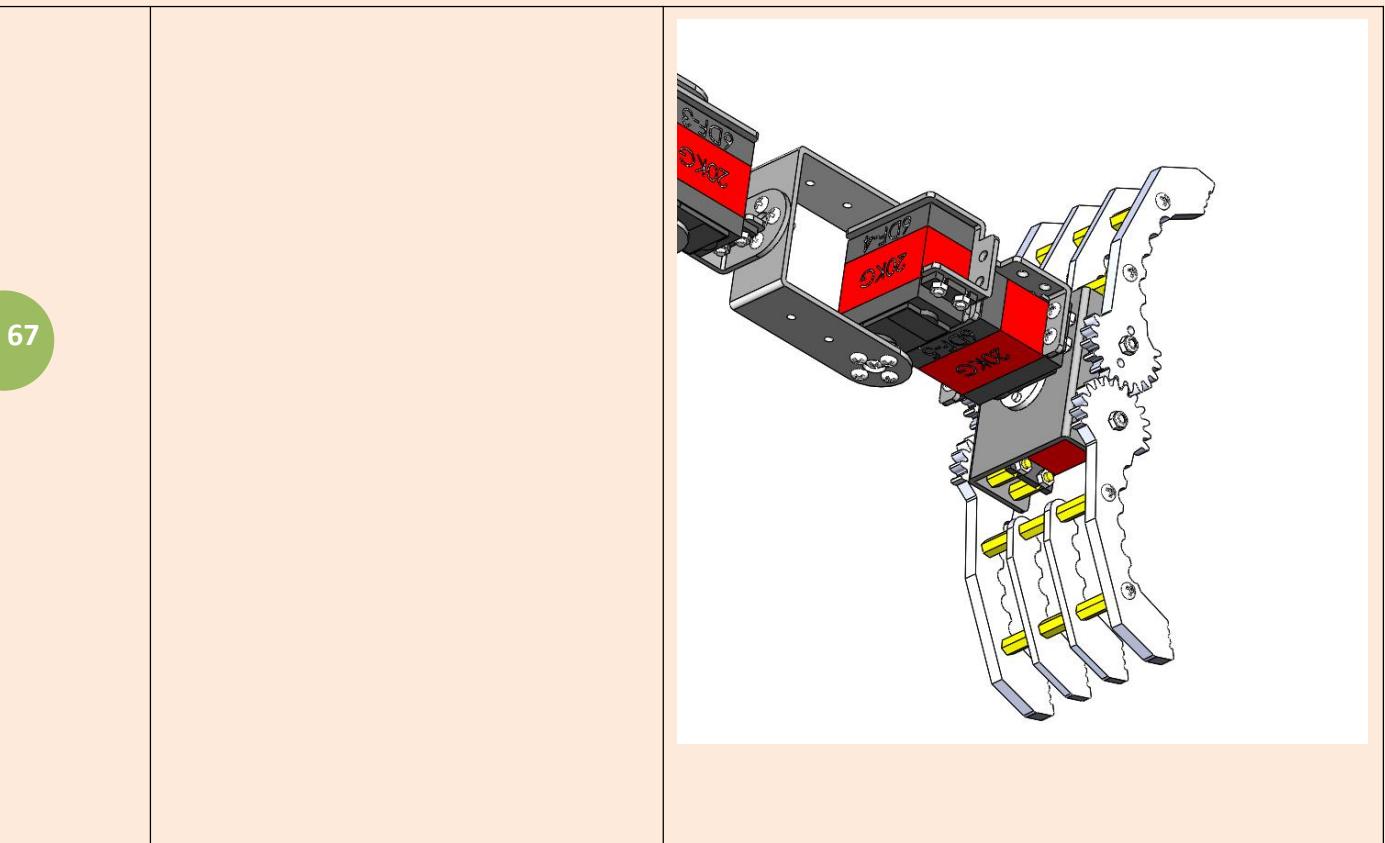
**Three parallel sides**



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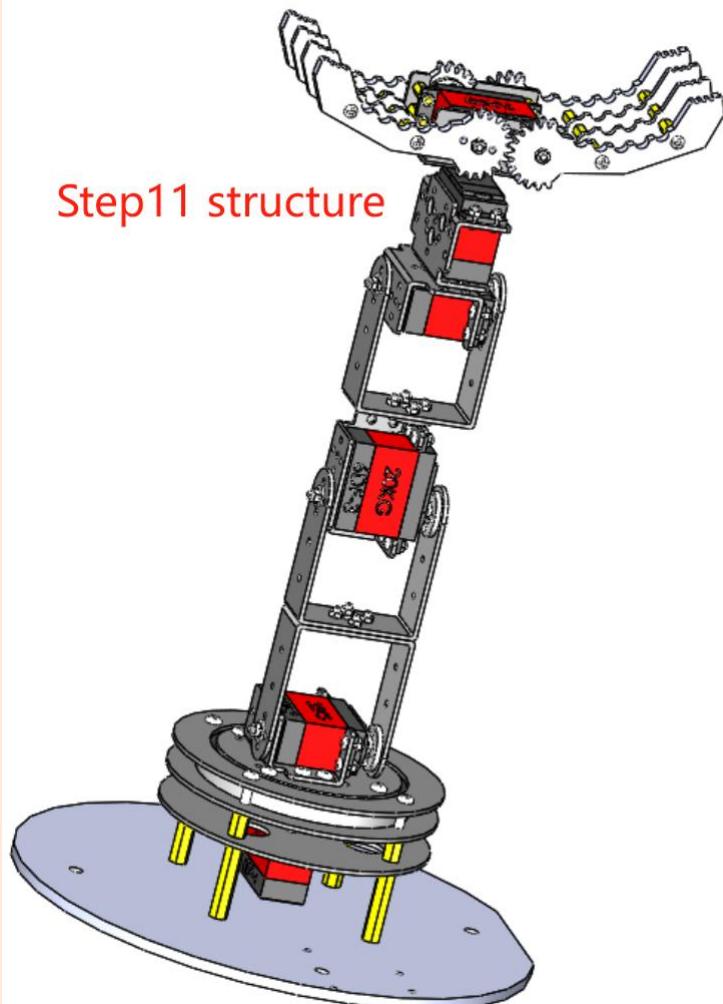
4. Use M3 \* 8mm round head screw to fix acrylic structural component 2 and acrylic structural component 4 respectively on the M3 \* 17mm copper column;





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Step11 structure



### Step 12

Assemble suction cup and main control board

Tool

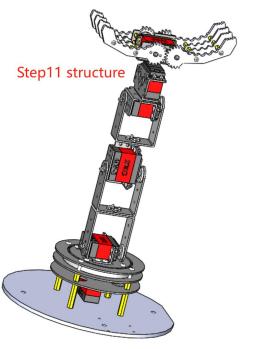
M3 Phillips screwdriver



simple wrench

/

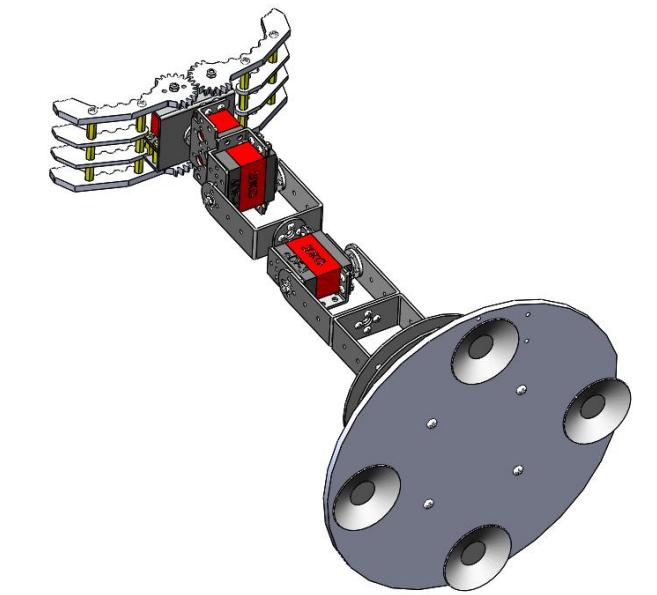
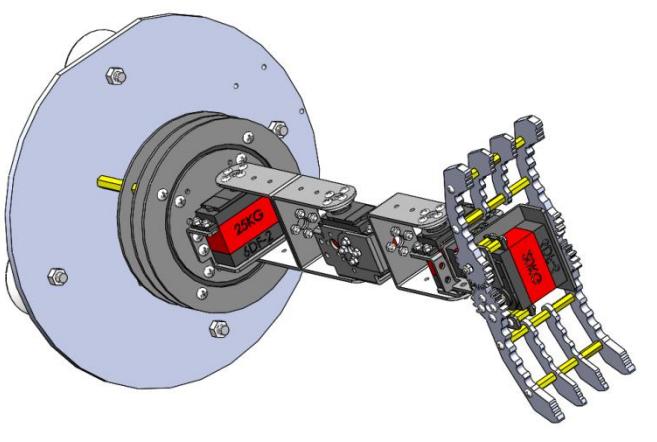
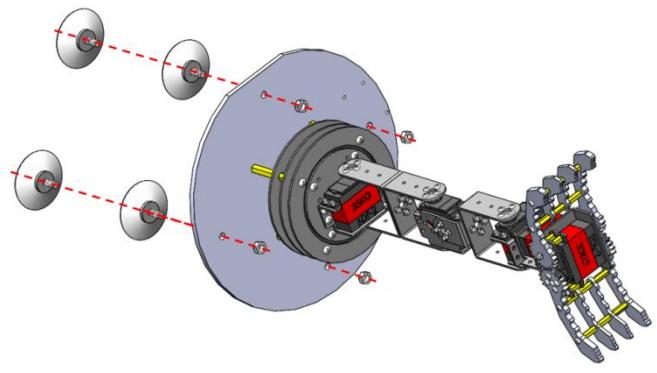
Parts List	Name	Quantity	Unit	Picture

69	step 11 structure	1	PCS	
	suction cup	4	PCS	
	M3*17mm copper column	4	PCS	
	M3*8mm round head screw	8	PCS	
Control board		1	PCS	
<b>Detailed steps</b>	<b>Description</b>		<b>Installation Diagram</b>	

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1. Use the suction cup's built-in nut to assemble the suction cup onto the base and tighten it (**do not attach the suction cup to the desktop after assembly**):

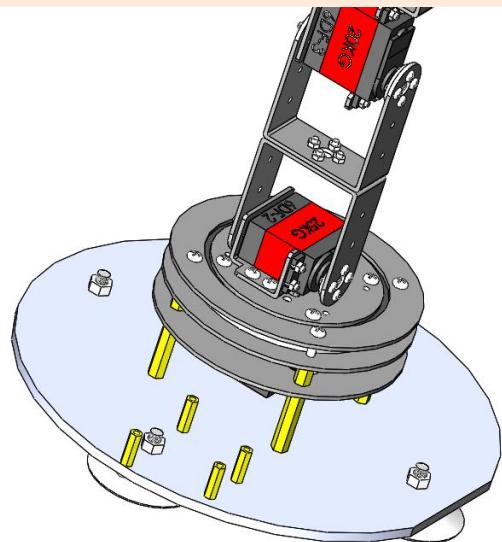
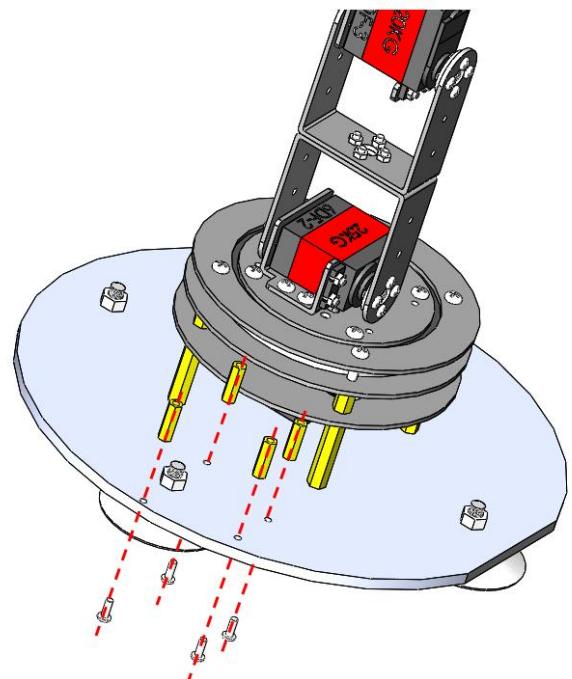
Attention: Suction cup assembly direction:



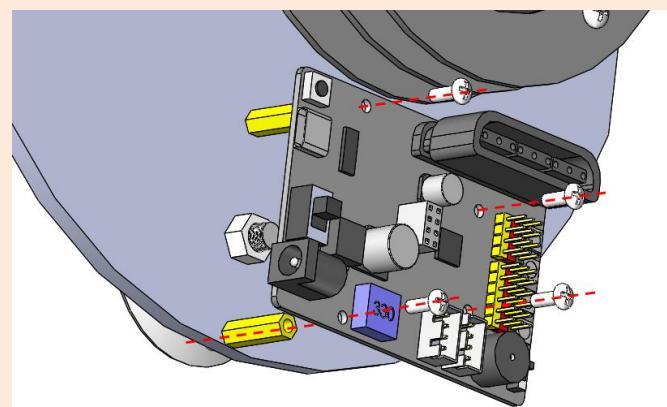
71

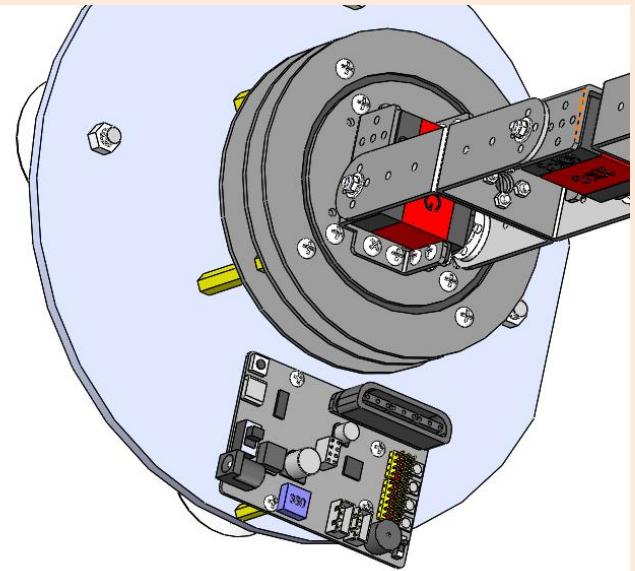
2. Use 4pcs M3 \* 8mm round head screws to fix the M3 \* 17mm copper columns onto the acrylic chassis of the robotic arm;

**Attention:** Copper column assembly direction, the copper column are installed on top of the acrylic chassis;



3. Use 4pcs M3 \* 8round head screws to secure the main control board(Robotic Arm Driver Hat) to the copper column





### 3.2 Assemble the servo wires to the Robotic Arm Driver Hat

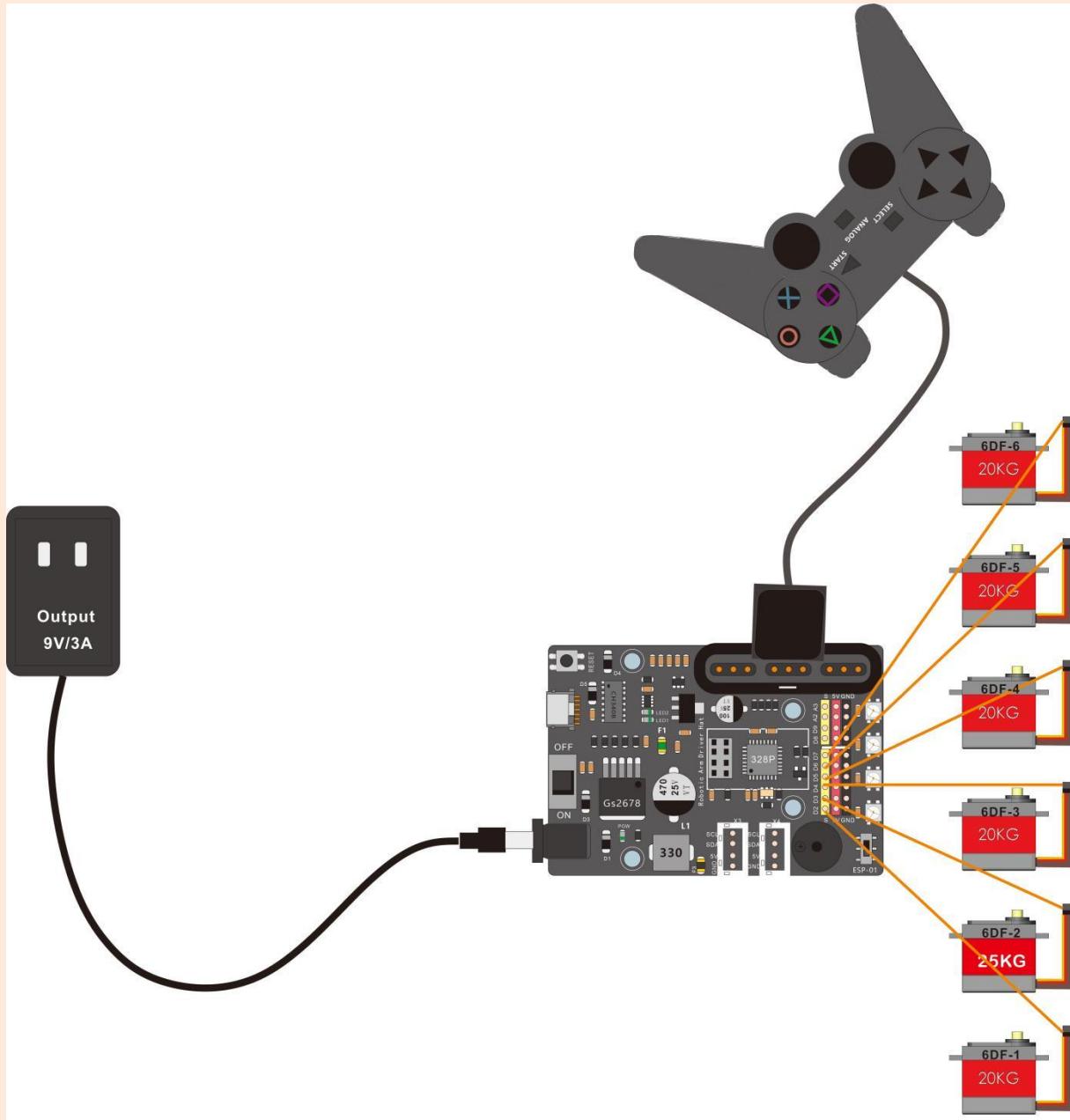
Six servos are labeled with 6DF-1, 6DF-2, 6DF-3, 6DF-4, 6DF-5, and 6DF-6 for easy differentiation

The signal pins of the 6 servos correspond to the signal pins on the Robot Arm Hat as shown in the table below.

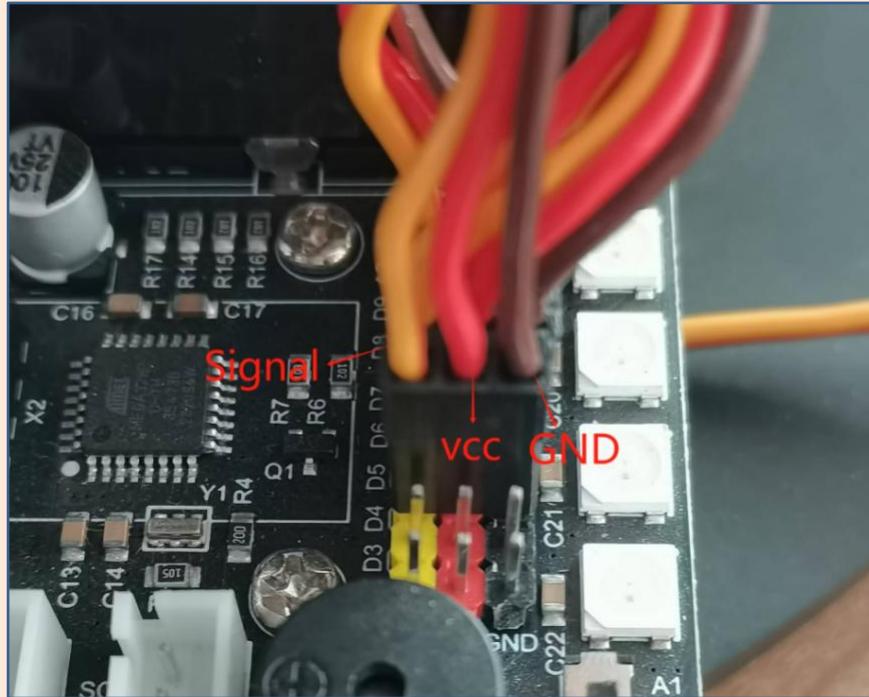
Servo No.	Signal Pin of Robotic Arm Hat
6DF-1	D2
6DF-2	D3
6DF-3	D4
6DF-4	D5
6DF-5	D6
6DF-6	D7

Connect 6 servos to the Robot Arm Driver Hat as shown in the following figure

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The female terminal of the servo motor is plugged into the correct position on the Robot Arm Drive Hat. Signal corresponds to the yellow pin, VCC corresponds to the red pin, and GND corresponds to the black pin.



### 3.3 Assemble the Wired Handle controller and the power adapter

Install the Wired Handle controller and power adapter onto the Robot Arm Driver Hat according to the image in step 3.2.

## 4. Assembly completed

Congratulations on successfully assembling this 6DOF robotic arm. You can now experience the fun of this robotic arm according to Lesson 7. Have a pleasant experience and have fun.